

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PEN 12,2 a1
 Edition : 30.10.92
 Replaces : 03.90
 Test oil : ISO-4113
 Combination no. : C 401 846 382A
 Injection pump
 Pump designation : PE6P120A320RS3206-1
 EP type number : 0 411 826 775
 Governor
 Governor design. : RQ750PA783-1
 Governor no. : 0 421 801 432

Customer-spec. information
 Customer : PENTA

Engine : TAMD 122

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00

A01

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.70...12.80

Del.quantity cm³/ : 30.9...31.1

100 s: (30.6...31.4)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.9...5.1

Del.quantity cm³/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm³ : 0.5

100 s: (0.8)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 309.0...311.0

1000 : (306.0...314.0)

Spread cm³ : 5.00

1000 : (9.90)

RATED SPEED

1st version

Testing:

1st rack travel in: 11.40

Speed rpm : 896...901

2nd rack travel in: 4.00

Speed rpm : 933...948

4th rack travel in: 1000

Speed rpm : 0.00...1.00

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.40

Speed rpm : 896...901

Remarks:

:

APPLICATION

Generator set



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA
 Edition : 30.10.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 401 846 955
 Injection pump
 Pump designation : PE6P120A32ORS3196
 EP type number : 0 411 826 763
 Governor
 Governor design. : RQ200/1100PA998
 Governor no. : 0 421 801 614

Customer-spec. information
 Customer : SCANIA

Engine : DSC9 10

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 1 688 901 104
 Opening
 pressure, bar : 250...253
 Orifice plate
 diameter mm : 0,7
 Test lines : 1 680 750 008
 Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600
 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 5.00...5.10
 : (4.95...5.15)
 Rack travel in mm : 9.00...12.00

A03

Firing order : 1- 5- 3- 6- 2- 4
 Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700
 Rack travel in mm : 10.50...10.60
 Del.quantity cm³/ : 13.2...13.4
 100 s: (12.9...13.7)
 Spread cm³ : 0.8
 100 s: (1.2)
 2nd speed rpm : 250.0
 Rack travel in mm : 4.6...5.0
 Del.quantity cm³/ : 1.2...1.6
 100 s: (-)
 Spread cm³ : 0.4
 100 s: (0.8)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
 travel mm : 0.90...1.30
 2nd speed rpm : 350
 travel mm : 2.30...2.90
 3rd speed rpm : 650
 travel mm : 3.80...4.20
 4th speed rpm : 1180
 travel mm : 4.40...4.60
 5th speed rpm : 1280
 travel mm : 5.60...6.00

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 600
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700
 Aneroid pressure h: 900
 Del.quantity : 132.0...134.0
 1000 : (129.0...137.0)

Spread cm³ : 8.00
1000 : (12.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600
Rack travel in mm : 16.5

Testing:

1st rack travel in: 9.50
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1265...1295
4th rack travel in: 1380
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 4.7

Testing:

Speed rpm : 100
Minimum rack travel: 6.20
Speed rpm : 250
Rack travel in mm : 4.60...4.80
Rack travel in mm : 2.00
Speed rpm : 320...380

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 10.50...10.60

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.80...10.20
2nd pressure hPa : 350
Rack travel in m: 10.20...10.30
3rd pressure hPa : 320
Rack travel in m: 10.00...10.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 1100
Del. quantity cm³/ : 128.0...136.0
1000 s: (126.0...138.0)

Aneroid pressure h: -
Speed rpm : 500
Del. quantity cm³/ : 114.0...118.0
1000 s: (112.0...120.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 9.50
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Rack travel in mm : 9.80...10.20

LOW IDLE

Speed rpm : 250
Rack travel in mm : 4.60...4.80

Remarks:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

Two-part control lever.

APPLICATION

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA
 Edition : 30.10.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 401 846 956
 Injection pump
 Pump designation : PE6P120A320RS3196
 EP type number : 0 411 826 763
 Governor
 Governor design. : RQV200...1100PA729-4
 Governor no. : 0 421 813 950

Customer-spec. information
 Customer : SCANIA

Engine : DSC9 10

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 1 688 901 104
 Opening pressure, bar : 250...253
 Orifice plate diameter mm : 0,7
 Test lines : 1 680 750 008
 Outside diameter x Wall thickness x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 5.00...5.10
 : (4.95...5.15)
 Rack travel in mm : 9.00...12.00

A05

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700
 Rack travel in mm : 10.50...10.60
 Del.quantity cm³/ : 13.2...13.4
 100 s: (12.9...13.7)
 Spread cm³ : 0.8
 100 s: (1.2)
 2nd speed rpm : 250.0
 Rack travel in mm : 4.6...5.0
 Del.quantity cm³/ : 1.2...1.6
 100 s: (-)
 Spread cm³ : 0.4
 100 s: (0.8)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
 travel mm : 0.70...1.10
 2nd speed rpm : 350
 travel mm : 2.00...2.60
 3rd speed rpm : 650
 travel mm : 4.90...5.50
 4th speed rpm : 1145
 travel mm : 8.30...8.50
 5th speed rpm : 1250
 travel mm : 9.20...9.60

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1120
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700
 Aneroid pressure h: 900
 Del.quantity : 132.0...134.0
 1000 : (129.0...137.0)

Spread cm³ : 8.00
1000 : (12.00)

RATED SPEED

1st version
Control lever
position degrees: 111...119

Testing:
1st rack travel in: 9.50
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1235...1265
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 60...68

Testing:
Speed rpm : 100
Minimum rack travel: 6.20
Speed rpm : 250
Rack travel in mm : 4.60...4.80
Rack travel in mm : 2.00
Speed rpm : 320...380

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 10.50...10.60

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.80...10.20
2nd pressure hPa : 350
Rack travel in m: 10.20...10.30
3rd pressure hPa : 320
Rack travel in m: 10.00...10.20

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 1100
Del.quantity cm³/ : 128.0...136.0
1000 s: (126.0...138.0)
Aneroid pressure h: -
Speed rpm : 500

Del.quantity cm³/ : 114.0...118.0
1000 s: (112.0...120.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.50
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Rack travel in mm : 10.50...10.60

LOW IDLE

Speed rpm : 250
Rack travel in mm : 4.60...4.80

Remarks:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

Start-of-delivery setting with ROEO
diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VOL
 Edition : 23.10.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 401 846 968
 Injection pump
 Pump designation : PE6P110A320RS3197
 EP type number : 0 411 816 752
 Governor
 Governor design. : RGV300...1100PA589-4
 Governor no. : 0 421 814 022

Customer-spec. information
 Customer : VME

Engine : TD102 KF

1st version kW : 200.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 9.00...12.00

A07

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700
 Rack travel in mm : 11.90...12.00
 Del.quantity cm³/ : 16.7...16.9
 100 s : (16.4...17.2)
 Spread cm³ : 0.4
 100 s : (0.7)

2nd speed rpm : 300.0
 Rack travel in mm : 4.4...4.8
 Del.quantity cm³/ : 2.5...2.9
 100 s : (2.2...3.2)
 Spread cm³ : 0.4
 100 s : (0.7)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
 travel mm : 1.00...1.40
 2nd speed rpm : 350
 travel mm : 2.20...2.70
 3rd speed rpm : 450
 travel mm : 3.70...4.10
 4th speed rpm : 750
 travel mm : 6.30...6.70
 5th speed rpm : 1160
 travel mm : 7.90...8.10

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1180
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700
 Aneroid pressure h: 1000
 Del.quantity : 167.0...169.0
 1000 : (164.0...172.0)

Spread cm³ : 4.00
1000 : (7.50)

RATED SPEED

1st version
Control lever
position degrees: 115...123

Testing:
1st rack travel in: 10.90
Speed rpm : 1160...1170
2nd rack travel in: 4.00
Speed rpm : 1225...1255
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 60...68

Testing:
Speed rpm : 100
Minimum rack travel: 5.90
Speed rpm : 300
Rack travel in mm : 4.30...4.50

CONSTANT REGULATION
Speed rpm : 250...380

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 1000
Rack travel mm : 11.90...12.00

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.80...10.20
2nd pressure hPa : 210
Rack travel in m: 10.00...10.10

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: -
Speed rpm : 700
Del.quantity cm³/ : 127.0...129.0
1000 s: (124.0...132.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.90
Speed rpm : 1160...1170

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 160.0...190.0
1000 s: (156.0...194.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 300
Rack travel in mm : 4.30...4.50

Remarks:

:

Delivery-valve spring pre-tension =
2.40...2.60 mm.
Permissible alteration from 2.20...2.90
mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF
 Edition : 30.10.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 401 846 969
 Injection pump
 Pump designation : PE6P110A32ORS3312
 EP type number : 0 411 816 788
 Governor
 Governor design. : RQ300/1000PA1012-1
 Governor no. : 0 421 801 648

Customer-spec. information
 Customer : DAF

Engine : LT 160 L

1st version kW : 160.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80
 : (3.65...3.85)
 Rack travel in mm : 14.00...15.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.50...5.70
 & maximum rack tra: 13.9...14.9
 Difference ° CS : 4.00...6.00

BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 14.40...14.50

Del.quantity cm³/ : 17.3...17.5

100 s: (17.0...17.7)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 5.5...5.7

Del.quantity cm³/ : 1.6...2.1

100 s: (1.4...2.4)

Spread cm³ : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del.quantity : 173.0...175.0

1000 : (170.5...177.5)

Spread cm³ : 4.00

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.40
Speed rpm : 1045...1060
2nd rack travel in: 4.00
Speed rpm : 1110...1140
4th rack travel in: 1300
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.6

Testing:

Speed rpm : 200
Minimum rack travel: 9.90
Speed rpm : 300
Rack travel in mm : 5.50...5.70
Rack travel in mm : 2.00
Speed rpm : 330...370

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 850
Rack travel in m: 15.10...15.20
2nd speed rpm : 1000
Rack travel in m: 15.00...15.20

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 600
Pressure hPa : 1000
Rack travel mm : 14.40...14.50

Measurement

Speed 1/min : 600
1st pressure hPa : -
Rack travel in m: 12.30...12.50
2nd pressure hPa : 530
Rack travel in m: 13.90...14.00
3rd pressure hPa : 380
Rack travel in m: 12.90...13.10

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600
Del.quantity cm³/ : 131.0...133.0
1000 s: (128.5...135.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.40
Speed rpm : 1045...1060

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 330.0...370.0
1000 s: (327.0...373.0)
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 300
Rack travel in mm : 5.50...5.70
Del.quantity cm³/ : 16.5...21.5
1000 s: (14.0...24.0)
Spread cm³ : 4.50
1000 s: (7.50)

Remarks:

:
Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 18,3 n 2
 Edition : 23.10.92
 Replaces : 04.91
 Test oil : ISO-4113
 Combination no. : 0 401 849 753
 Injection pump
 Pump designation : PE10P110A320LS3844
 EP type number : 0 411 819 710
 Governor
 Governor design. : RQ300/1050PA187-32
 Governor no. : 0 421 801 554

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM 443

1st version kW : 243.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 130...150

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10
 : (3.95...4.15)
 Rack travel in mm : 9.00...12.00
 Firing order : 10- 9- 4- 1- 8- 7-
 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-
 216-261-288-333
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

BASIC SETTING

1st speed rpm : 750
 Rack travel in mm : 11.60...11.70
 Del.quantity cm³/ : 10.2...10.4
 100 s: (9.9...10.6)
 Spread cm³ : 0.4
 100 s: (0.7)

2nd speed rpm : 300.0
 Rack travel in mm : 8.3...8.6
 Del.quantity cm³/ : 1.5...2.1
 100 s: (1.2...2.3)
 Spread cm³ : 0.4
 100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 600
 Rack travel in mm : 13.60...14.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 750
 Del.quantity : 102.0...104.0
 1000 : (99.5...106.5)
 Spread cm³ : 4.00
 1000 : (7.50)

RATED SPEED

1st version
 Setting point:
 Speed rpm : 600
 Rack travel in mm : 13.7

Testing:
 1st rack travel in: 10.60

Speed rpm : 1095...1110
2nd rack travel in: 4.00
Speed rpm : 1150...1180
4th rack travel in: 1300
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.9

Testing:

Speed rpm : 200
Minimum rack trave: 8.50
Speed rpm : 300
Rack travel in mm : 6.80...7.00
Rack travel in mm : 2.00
Speed rpm : 400...440

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 1050
Del.quantity cm³/ : 118.0...122.0
1000 s: (115.0...125.0)
Spread cm³ : 6.00
1000 s: (9.00)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.60
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 140.0...160.0
1000 s: (136.0...164.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : STE 10,0 b2
 Edition : 25.09.92
 Replaces : 12.88
 Test oil : ISO-4113
 Combination no. : 0 401 856 158
 Injection pump
 Pump designation : PE6P110A721RS369
 EP type number : 0 411 816 121
 Governor
 Governor design. : R2V250...1300PA413-4
 Governor no. : 0 421 813 732

Customer-spec. information
 Customer : HAEP

Engine : WD615.61/71

1st version kW : 191.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 13.80...13.90

Del.quantity cm³/ : 14.5...14.7

100 s: (14.2...15.0)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 8.5...9.1

Del.quantity cm³/ : 1.8...2.4

100 s: (1.5...2.6)

Spread cm³ : 0.4

100 s: (0.7)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 0.50...0.90

2nd speed rpm : 500

travel mm : 2.40...3.00

3rd speed rpm : 800

travel mm : 4.40...5.00

4th speed rpm : 1340

travel mm : 8.60...8.80

5th speed rpm : 1450

travel mm : 10.00...10.40

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1390

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 145.0...147.0

1000 : (142.0...150.0)

Spread cm³ : 4.00
1000 : (7.50)

RATED SPEED

1st version
Control lever
position degrees: 100...108

Testing:

1st rack travel in: 12.80
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1445...1475
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 68...76

Testing:

Speed rpm : 100
Minimum rack travel: 10.20
Speed rpm : 250
Rack travel in mm : 8.70...8.90

CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 700
Pressure hPa : 700
Rack travel mm : 13.80...13.90

Measurement

Speed 1/min : 700

1st pressure hPa : -
Rack travel in m: 12.00...12.20
2nd pressure hPa : 390
Rack travel in m: 13.50...13.60
3rd pressure hPa : 320
Rack travel in m: 12.90...13.10

START CUT-OUT

Speed 1/min : 170 (190)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 700

Del. quantity cm³/ : 133.0...137.0
1000 s: (130.0...140.0)
Aneroid pressure h: -
Speed rpm : 700
Del. quantity cm³/ : 101.0...103.0
1000 s: (98.0...106.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 12.80
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 135.0...155.0
1000 s: (131.0...159.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : HAE
 Edition : 23.10.92
 Replaces : 10.92
 Test oil : ISO-4113

Combination no. : 0 401 856 159

Injection pump
 Pump designation : PE6P110A721RS369
 EP type number : 0 411 816 121
 Governor
 Governor design. : RQ300/1300PA412-6
 Governor no. : 0 421 801 638

Customer-spec. information
 Customer : HAEP

Engine : WD615.60

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
 x wall thickness
 x length mm : 8.00x2.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
 : (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 14.10...14.20

Del.quantity cm³/ : 14.6...14.8

100 s: (14.3...15.0)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 8.8...9.2

Del.quantity cm³/ : 1.8...2.4

100 s: (1.5...2.6)

Spread cm³ : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 15.80...17.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 146.0...148.0

1000 : (143.5...150.5)

Spread cm³ : 4.00

1000 : (7.50)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 16.4

Testing:

1st rack travel in: 13.10

Speed rpm : 1345...1360

2nd rack travel in: 4.00

Speed rpm : 1425...1455

4th rack travel in: 1550

Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.0

Testing:

Speed rpm : 100

Minimum rack trave: 7.40

Speed rpm : 300

Rack travel in mm : 5.90...6.10

Rack travel in mm : 2.00

Speed rpm : 400...440

TORQUE CONTROL

Dimension a mm : 0.40

Torque control curve - 1st version

1st speed rpm : 1300

Rack travel in m: 14.10...14.20

2nd speed rpm : 700

Rack travel in m: 14.60...15.00

3rd speed rpm : 900

Rack travel in m: 14.50...14.70

4th speed rpm : 1100

Rack travel in m: 14.30...14.50

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 700

Pressure hPa : 700

Rack travel mm : 14.30...14.50

Measurement

Speed 1/min : 700

1st pressure hPa : -

Rack travel in m: 12.40...12.60

2nd pressure hPa : 390

Rack travel in m: 14.10...14.20

3rd pressure hPa : 300

Rack travel in m: 12.70...12.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 700

Del.quantity cm3/ : 135.0...139.0

1000 s: (132.0...142.0)

Aneroid pressure h: -

Speed rpm : 700

Del.quantity cm3/ : 101.0...103.0

1000 s: (98.5...105.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.10

Speed rpm : 1345...1360

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 135.0...155.0

1000 s: (131.0...159.0)

Rack travel in mm : 16.50...17.50

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PEN 6,1 q 1
 Edition : 23.10.92
 Replaces : 07.92
 Test oil : ISO-4113
 Combination no. : 0 401 876 340
 Injection pump
 Pump designation : PE6P110A32ORS499
 EP type number : 0 411 816 169
 Governor
 Governor design. : RSV325...1400POA374-9
 Governor no. : 0 421 833 335

Customer-spec. information
 Customer : PENTA

Engine : TAMD61

1st version kw : 221.0
 Rated speed : 2800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.40...2.50
 : (2.35...2.55)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.10...11.20

Del. quantity cm³/ : 11.9...12.1

100 s: (11.6...12.4)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 325.0

Rack travel in mm : 4.1...4.3

Del. quantity cm³/ : 1.1...1.5

100 s: (0.9...1.7)

Spread cm³ : 0.3

100 s: (0.6)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 6.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 900

Del. quantity : 119.0...121.0

1000 : (116.0...124.0)

Spread cm³ : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 114...122

Testing:

1st rack travel in: 10.10

Speed rpm : 1450...1460

2nd rack travel in: 4.00
Speed rpm : 1525...1555
4th rack travel in: 1630
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 79...87
Setting point w/out bumper spring
Speed rpm : 325
Rack travel in mm : 3.7
Speed rpm : 325
Rack travel in mm : 4.10...4.30
Rack travel in mm : 2.00
Speed rpm : 450...510

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 11.00...11.20

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 8.90...9.10
2nd pressure hPa : 370
Rack travel in m: 9.10...9.20
3rd pressure hPa : 720
Rack travel in m: 10.60...10.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 1400
Del.quantity cm³/ : 121.0...125.0
1000 s: (118.0...128.0)

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 61.0...63.0
1000 s: (58.0...66.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.10
Speed rpm : 1450...1460

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...165.0
1000 s: (131.0...169.0)

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.10...4.30
Del.quantity cm³/ : 11.0...15.0
1000 s: (9.0...17.0)
Spread cm³ : 3.00
1000 s: (6.00)

Remarks:

APPLICATION

Navy

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 23.10.92
 Replaces : -
 Test oil : ISO-4113

 Combination no. : 0 401 876 788

 Injection pump
 Pump designation : PE6P110A320LS3835-3
 EP type number : 0 411 816 773
 Governor
 Governor design. : RSV350...1050POA556
 -1
 Governor no. : 0 421 833 392

 Customer-spec. information
 Customer : MERCEDES-BENZ

 Engine : OM 441

 1st version kW : 165.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

 Overflow valve
 : 1 417 413 025

 Inlet press., bar : 1.50

 Overflow
 quantity min. 1/h: 100...120

 Test nozzle holder
 assembly : 0 681 343 009

 Opening
 pressure, bar : 172...175

 Test lines : 1 680 750 015

 Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

A19

Prestroke mm : 4.00...4.10
 : (3.95...4.15)
 Rack travel in mm : 9.00...12.00
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1050

 Rack travel in mm : 12.70...12.80

 Del.quantity cm³/ : 13.6...13.8
 100 s: (13.3...14.0)

 Spread cm³ : 0.4
 100 s: (0.8)

2nd speed rpm : 350.0
 Rack travel in mm : 8.3...8.9
 Del.quantity cm³/ : 1.2...1.8
 100 s: (0.9...2.0)
 Spread cm³ : 0.4
 100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...0.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1050
 Del.quantity : 136.0...138.0
 1000 : (133.5...140.5)
 Spread cm³ : 4.00
 1000 : (8.00)

RATED SPEED

1st version
 Control lever
 position degrees: 88...96

Testing:
 1st rack travel in: 11.70
 Speed rpm : 1070...1080
 2nd rack travel in: 4.00

Speed rpm : 1115...1133
4th rack travel in: 1300
Speed rpm : 0.30...1.40

APPLICATION

Excavator

LOW IDLE 1

Control lever
position degrees: 64...72
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 8.6

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 350
Rack travel in mm : 8.30...8.90
Rack travel in mm : 2.00
Speed rpm : 380...440

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750
Del. quantity cm³/ : 124.0...128.0
1000 s: (121.0...131.0)
Spread cm³ : 6.00
1000 s: (8.00)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.70
Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 140.0...160.0
1000 s: (136.0...164.0)

Remarks:

:

Set 14.1...14.3 mm control-rod travel
at lower full-load stop with
n = 1030 1/min.
Make full-load setting at upper full-
load stop in accordance with test
specifications.

Observe VDT-I-420/120

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 8,8 d 5
Edition : 23.10.92
Replaces : 05.92
Test oil : ISO-4113
Combination no. : 0 402 046 328
Injection pump
Pump designation : PES6P120A320RS419-2
EP type number : 0 412 026 048
Governor
Governor design. : RQ275/PS0PA753-1
Governor no. : 0 421 801 377

Customer spec. information
Customer : RVI

Engine : MIDS/PS062045 FC

1st version kW : 144.0
Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
assembly : 1 688 901 019

Opening
pressure, bar : 207...210

Orifice plate
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
x Wall thickness
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90
: (2.75...2.95)
Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 8.70...8.80

Del.quantity cm3/ : 12.0...12.2

100 s: (11.7...12.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 4.3...5.2

Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 525

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 500

Aneroid pressure h: 700

Del.quantity : 120.0...122.0

1000 : (117.0...125.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 525

Rack travel in mm : 20.0

Testing:

1st rack travel in: 7.20

Speed rpm : 1015...1030

2nd rack travel in: 4.00

Speed rpm : 1050...1080
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 4.4

Testing:

Speed rpm : 150
Minimum rack travel: 5.80
Speed rpm : 250
Rack travel in mm : 4.20...4.40
Rack travel in mm : 2.00
Speed rpm : 330...370

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 500
Rack travel in m: 8.70...8.80
2nd speed rpm : 950
Rack travel in m: 8.00...8.20
3rd speed rpm : 750
Rack travel in m: 8.30...8.50

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 700
Rack travel mm : 8.70...8.80

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 8.00...8.20
2nd pressure hPa : 240
Rack travel in m: 8.45...8.55

START CUT-OUT

Speed 1/min : 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 950
Del.quantity cm³/ : 140.0...144.0
1000 s: (137.0...147.0)
Aneroid pressure h: -
Speed rpm : 500

Del.quantity cm³/ : 107.0...109.0
1000 s: (104.0...112.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 7.20
Speed rpm : 1015...1030

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 140.0...160.0
1000 s: (136.0...164.0)

LOW IDLE

Speed rpm : 250
Rack travel in mm : 4.80...5.20
Del.quantity cm³/ : 17.0...23.0
1000 s: (14.0...26.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

:

Start-of-delivery mark 9.5° cam angle
after start of delivery cyl. 1

APPLICATION

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : UNI 8,1 a
 Edition : 23.10.92
 Replaces : 09.91
 Test oil : ISO-4113

Combination no. : 0 402 046 349

Injection pump
 Pump designation : PES6P110A72ORS530
 EP type number : 0 412 016 075
 Governor
 Governor design. : RQV300...1000PA1016-5
 Governor no. : 0 421 813 970

Customer-spec. information
 Customer : IVECO-UNIC

Engine : 8365.25.540

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness x Length mm : 6.00x1.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10
 : (1.95...2.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 10.00...10.10

Del.quantity cm3/ : 11.0...11.2
 100 s: (10.7...11.4)

Spread cm3 : 0.4
 100 s: (0.7)

2nd speed rpm : 300.0
 Rack travel in mm : 6.4...6.8
 Del.quantity cm3/ : 1.8...2.3
 100 s: (1.5...2.5)

Spread cm3 : 0.4
 100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1075
 travel mm : 8.20...8.40

2nd speed rpm : 300
 travel mm : 1.00...1.40

3rd speed rpm : 450
 travel mm : 3.30...3.90

4th speed rpm : 700
 travel mm : 5.30...5.70

5th speed rpm : 1400
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1

Speed rpm : 1210

Rack travel in mm : 8.30...10.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1000
 Aneroid pressure h: 700
 Del.quantity : 110.0...112.0
 1000 : (107.5...114.5)

Spread cm3 : 4.00
 1000 : (7.50)

RATED SPEED

1st version
Control lever
position degrees: 117...125

Testing:
1st rack travel in: 9.00
Speed rpm : 1070...1080
2nd rack travel in: 4.00
Speed rpm : 1140...1170
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 66...74

Testing:
Speed rpm : 200
Minimum rack travel: 9.00
Speed rpm : 300
Rack travel in mm : 6.50...6.70

CONSTANT REGULATION
Speed rpm : 310...430

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 700
Rack travel mm : 10.00...10.10

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.30...9.50
2nd pressure hPa : 300
Rack travel in m: 9.80...9.90

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 700
Speed rpm : 600
Del.quantity cm3/ : 110.0...114.0
1000 s: (107.0...117.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 93.0...95.0
1000 s: (90.5...97.5)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.00
Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 180.0...210.0
1000 s: (176.0...214.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.40...6.80
Del.quantity cm3/ : 18.0...23.0
1000 s: (15.5...25.5)
Spread cm3 : 4.50
1000 s: (7.50)

Remarks:

:
Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 9,8 f 1
 Edition : 23.10.92
 Replaces : 12.91
 Test oil : ISO-4113
 Combination no. : 0 402 046 789
 Injection pump
 Pump designation : PES6P120A32ORS3139
 EP type number : 0 412 026 718
 Governor
 Governor design. : RQV275...1000PA728-3
 Governor no. : 0 421 813 657

Customer-spec. information
 Customer : RVI

Engine : MIDR 062045 H

1st version kw : 227.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.10...11.20

Del.quantity cm³/ : 19.3...19.5

100 s : (19.0...19.8)

Spread cm³ : 0.5

100 s : (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.5...5.7

Del.quantity cm³/ : 2.2...2.6

100 s : (1.9...2.9)

Spread cm³ : 0.8

100 s : (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 0.90...1.10

2nd speed rpm : 450

travel mm : 3.30...3.70

3rd speed rpm : 800

travel mm : 5.60...6.00

4th speed rpm : 1000

travel mm : 7.00...7.20

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1170

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 193.0...195.0

1000 : (190.0...198.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version
Control Lever
position degrees: 115...123

Testing:
1st rack travel in: 10.10
Speed rpm : 1065...1075
2nd rack travel in: 4.00
Speed rpm : 1170...1200
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1
Control Lever
position degrees: 63...71

Testing:
Speed rpm : 200
Minimum rack travel: 7.20
Speed rpm : 275
Rack travel in mm : 5.50...5.70

CONSTANT REGULATION
Speed rpm : 310...415

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 1000
Rack travel mm : 11.10...11.20

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 8.80...9.00
2nd pressure hPa : 280
Rack travel in m: 10.40...10.50
3rd pressure hPa : 160
Rack travel in m: 9.40...9.60

START CUT-OUT

Speed 1/min : 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000
Speed rpm : 600
Del.quantity cm3/ : 191.0...197.0
1000 s: (188.0...200.0)

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 101.0...103.0
1000 s: (98.0...106.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.10
Speed rpm : 1065...1075

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 140.0...160.0
1000 s: (136.0...164.0)

LOW IDLE

Speed rpm : 275
Rack travel in mm : 5.50...5.70
Del.quantity cm3/ : 22.0...26.0
1000 s: (19.0...29.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

:
Start-of-delivery mark 9° cam angle
after start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 9,8 f
 Edition : 23.10.92
 Replaces : 06.90
 Test oil : ISO-4113
 Combination no. : 0 402 046 798
 Injection pump
 Pump designation : PES6P120A320RS3139
 EP type number : 0 412 026 718
 Governor
 Governor design. : RQ275/105CPA893
 Governor no. : 0 421 801 442

Customer-spec. information
 Customer : RVI

Engine : MIDR 062045 M
 1st version kW : 236.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 1 688 901 019
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,8
 Test lines : 1 680 750 075
 Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 600
 Rack travel in mm : 11.90...12.00
 Del.quantity cm³/ : 22.1...22.3
 100 s : (21.8...22.6)
 Spread cm³ : 0.5
 100 s : (0.9)

2nd speed rpm : 275.0
 Rack travel in mm : 5.4...5.8
 Del.quantity cm³/ : 2.6...3.0
 100 s : (2.3...3.3)
 Spread cm³ : 0.8
 100 s : (1.2)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -2
 Speed rpm : 600
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 600
 Aneroid pressure h: 1000
 Del.quantity : 221.0...223.0
 1000 : (218.0...226.0)
 Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
 Setting point:
 Speed rpm : 600
 Rack travel in mm : 20.0

Testing:
 1st rack travel in: 10.90
 Speed rpm : 1105...1120
 2nd rack travel in: 4.00

Speed rpm : 1200...1230
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 275
Rack travel in mm : 6.3

Testing:

Speed rpm : 175
Minimum rack travel: 7.10
Speed rpm : 275
Rack travel in mm : 5.50...5.70
Rack travel in mm : 2.00
Speed rpm : 340...380

TORQUE CONTROL

Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 600
Rack travel in m: 12.30...12.50
2nd speed rpm : 1050
Rack travel in m: 12.20...12.50

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 1000
Rack travel mm : 11.90...12.00

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 8.70...9.10
2nd pressure hPa : 360
Rack travel in m: 11.10...11.20
3rd pressure hPa : 160
Rack travel in m: 9.50...9.90

START CUT-OUT

Speed 1/min : 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 1050
Del.quantity cm³/ : 220.0...226.0
1000 s: (217.0...229.0)
Aneroid pressure h: -
Speed rpm : 500

Del.quantity cm³/ : 107.0...109.0
1000 s: (104.0...112.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.90
Speed rpm : 1105...1120

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...165.0
1000 s: (131.0...169.0)

LOW IDLE

Speed rpm : 275
Rack travel in mm : 5.40...5.80
Del.quantity cm³/ : 26.0...30.0
1000 s: (23.0...33.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

APPLICATION

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PER
 Edition : 23.10.92
 Replaces : 09.92
 Test oil : ISC-4113
 Combination no. : 0 402 046 840
 Injection pump
 Pump designation : PES6P120A320RS3307
 EP type number : 0 412 026 757
 Governor
 Governor design. : RQV250...950PA794-3
 Governor no. : 0 421 814 015

Customer-spec. information
 Customer : PERKINS

Engine : EAGLE TX 300/335

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Overflow
 quantity min. l/h: 115...135
 Test nozzle holder
 assembly : 1 688 901 019
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,8
 Test lines : 1 680 750 067
 Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 12.00...13.00
 Firing order : 1- 4- 2- 6- 3- 5

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900
 Rack travel in mm : 12.20...12.30
 Del. quantity cm³/ : 22.3...22.5
 100 s: (22.0...22.8)
 Spread cm³ : 0.6
 100 s: (0.9)
 2nd speed rpm : 250.0
 Rack travel in mm : 5.9...6.1
 Del. quantity cm³/ : 1.3...1.7
 100 s: (1.0...2.0)
 Spread cm³ : 0.3
 100 s: (0.6)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
 travel mm : 0.90...1.40
 2nd speed rpm : 350
 travel mm : 2.00...2.50
 3rd speed rpm : 660
 travel mm : 3.70...4.20
 4th speed rpm : 985
 travel mm : 7.40...7.60
 5th speed rpm : 1260
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1110
 Rack travel in mm : 10.00...12.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 900
 Aneroid pressure h: 1200

Del.quantity : 223.0...225.0
1000 : (220.0...228.0)
Spread cm3 : 6.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 113...121

Testing:
1st rack travel in: 11.30
Speed rpm : 980...990
2nd rack travel in: 4.00
Speed rpm : 1055...1085
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 78...86

Testing:
Speed rpm : 150
Minimum rack travel: 7.50
Speed rpm : 250
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION
Speed rpm : 250...450

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : 1200
Rack travel mm : 12.20...12.30

Measurement
Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 9.30...9.50
2nd pressure hPa : 340
Rack travel in m: 11.50...11.60
3rd pressure hPa : 220
Rack travel in m: 10.40...10.60

START CUT-OUT

Speed 1/min : 170 (190)

FUEL DELIVERY CHARACTERISTICS

1st version

B02

Aneroid pressure h: -
Speed rpm : 600
Del.quantity cm3/ : 134.0...136.0
1000 s: (131.0...139.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.30
Speed rpm : 980...990

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 160.0...200.0
1000 s: (156.0...204.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.90...6.10

Remarks:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring
preload on new delivery-valve holders
to 2.9...3.1 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC
 Edition : 23.10.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 046 841
 Injection pump
 Pump designation : PES6P100A32DLS3309
 EP type number : 0 412 006 704
 Governor
 Governor design. : RQV350...1300PA1042-4K
 Governor no. : 0 421 815 328

Customer-spec. information
 Customer : NAVISTAR

Engine : DTA-408

1st version kW : 171.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 2 417 413 038
 Inlet press., bar : 2.80
 Overflow
 quantity min. 1/h: 240...260
 Test nozzle holder
 assembly : 1 688 901 101
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,6
 Test lines : 1 680 750 008
 Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24
 Prestroke mm : 2.95...3.05
 : (2.90...3.10)
 Rack travel in mm : 14.00...15.00
 Firing order : 1- 5- 3- 6- 2- 4
 Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900
 Rack travel in mm : 12.60...12.70
 Del. quantity cm³/ : 14.7...14.9
 100 s: (14.5...15.1)
 Spread cm³ : 0.8
 100 s: (1.2)
 2nd speed rpm : 350.0
 Rack travel in mm : 5.4...5.6
 Del. quantity cm³/ : 1.3...1.7
 100 s: (1.0...1.9)
 Spread cm³ : 0.4
 100 s: (0.6)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350
 travel mm : 1.60...2.00
 2nd speed rpm : 500
 travel mm : 3.80...4.20
 3rd speed rpm : 800
 travel mm : 5.80...6.20
 4th speed rpm : 1300
 travel mm : 8.90...9.10
 5th speed rpm : 1500
 travel mm : 10.40...10.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 900
 Aneroid pressure h: 1200
 Del. quantity : 147.5...149.5
 1000 : (145.5...151.5)

Spread cm³ : 8.00
1000 : (12.00)

RATED SPEED

1st version
Control lever
position degrees: 59...67

Testing:

1st rack travel in: 11.90
Speed rpm : 1340...1370
2nd rack travel in: 4.00
Speed rpm : 1500...1510
4th rack travel in: 1650
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 16...24

Testing:

Speed rpm : 275
Minimum rack travel: 6.00
Speed rpm : 350
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION

Speed rpm : 350...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 900
Rack travel in mm: 12.60...12.70
2nd speed rpm : 1300
Rack travel in mm: 12.90...13.10
3rd speed rpm : 700
Rack travel in mm: 11.60...12.00

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 1300
Pressure hPa : 1200
Rack travel mm : 12.90...13.10

Measurement

Speed 1/min : 1300
1st pressure hPa : -
Rack travel in mm: 9.50...9.90
2nd pressure hPa : 300
Rack travel in mm: 10.60...10.70
3rd pressure hPa : 670
Rack travel in mm: 12.00...12.40

START CUT-OUT

Speed 1/min : 290 (300)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 1300
Del. quantity cm³/ : 140.5...144.5
1000 s: (138.5...146.5)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 1300
Del. quantity cm³/ : 85.5...89.5
1000 s: (83.5...91.5)

BREAKAWAY

1st version

1mm rack travel less than
full load rack travel: 11.90
Speed rpm : 1340...1370

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 120.0...160.0
1000 s: (115.0...165.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.40...5.60
Del. quantity cm³/ : 13.0...17.0
1000 s: (10.5...19.5)
Spread cm³ : 4.00
1000 s: (6.50)

Remarks:

: NAVISTAR #1819917C91

Limit shutoff stop screw to 1.0 mm.

Bow dimension:

Sliding-sleeve position = 37.0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE
 Edition : 23.10.92
 Replaces : 09.92
 Test oil : ISO-4113

Combination no. : 0 402 076 745

Injection pump
 Pump designation : PES6P120A720RS3203
 EP type number : 0 412 026 728
 Governor
 Governor design. : RSV625...1100P2A534-9
 Governor no. : 0 421 833 372

Customer-spec. information
 Customer : JOHN DEERE

Engine : 6076 HZ 031

1st version kW : 205.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,5

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness : 6.00X3.00X600
 x Length mm

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65
 : (3.50...3.70)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.80...12.90

Del.quantity cm³/ : 17.6...17.8

100 s: (17.4...18.0)

Spread cm³ : 0.4

100 s: (0.6)

2nd speed rpm : 625.0
 Rack travel in mm : 5.4...5.6
 Del.quantity cm³/ : 2.7...3.1
 100 s: (2.5...3.3)
 Spread cm³ : 0.6
 100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1100
 Aneroid pressure h: 1200
 Del.quantity : 176.5...178.5
 1000 : (174.5...180.5)
 Spread cm³ : 4.00
 1000 : (6.50)

RATED SPEED

1st version
 Control lever
 position degrees: 42...50

Testing:

1st rack travel in: 11.80
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1205...1215
3rd rack travel in: 4.00
Speed rpm : 1195...1225
4th rack travel in: 1350
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 22...30
Setting point w/out bumper spring
Speed rpm : 625
Rack travel in mm : 5.0

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 625
Rack travel in mm : 5.40...5.60

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 12.80...12.90
2nd speed rpm : 700
Rack travel in m: 13.40...13.60

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 1200
Rack travel mm : 13.40...13.60

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 11.60...11.80
2nd pressure hPa : 645
Rack travel in m: 12.10...12.20
3rd pressure hPa : 840
Rack travel in m: 12.90...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 700
Del.quantity cm3/ : 189.0...193.0
1000 s: (187.0...195.0)
Aneroid pressure h: -
Speed rpm : 800

Del.quantity cm3/ : 143.0...147.0
1000 s: (141.0...149.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.80
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 90.0...110.0
1000 s: (85.0...115.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 625
Rack travel in mm : 5.40...5.60
Del.quantity cm3/ : 27.0...31.0
1000 s: (25.0...33.0)
Spread cm3 : 6.00
1000 s: (8.00)

Remarks:

: JOHN DEERE # RE47399

Adjustment without torque-control
spring retainer with 0,5 mm less
control-rod travel. Increase in
full-load delivery with torque-control
spring retainer.

Starting/full-load transition speed
from holding magnet = 450 1/min.

Start-of-delivery mark at 10° cam
rotation angle after start of delivery,
cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : UNI
 Edition : 23.10.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 646 607
 Injection pump
 Pump designation : PE6P130A72ORS7270
 EP type number : 0 412 636 821
 Governor
 Governor design. : RQV300...950PA946-4
 Governor no. : 0 421 814 026

Customer-spec. information
 Customer : IVECO-UNIC

Engine : 8210.42P.032

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve
 : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 1 688 901 105
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,8
 Test Lines : 1 680 750 075
 Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 5.00...5.10
 : (4.95...5.15)
 Rack travel in mm : 13.50...14.50

807

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 950
 Rack travel in mm : 11.30...11.40
 Del.quantity cm³/ : 21.1...21.3
 100 s: (20.8...21.6)
 Spread cm³ : 0.5
 100 s: (0.8)

2nd speed rpm : 275.0
 Rack travel in mm : 4.2...4.6
 Del.quantity cm³/ : 1.9...2.5
 100 s: (1.6...2.8)
 Spread cm³ : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 995
 travel mm : 8.40...8.60
 2nd speed rpm : 300
 travel mm : 1.10...1.30
 3rd speed rpm : 450
 travel mm : 2.80...3.40
 4th speed rpm : 650
 travel mm : 4.40...5.00
 5th speed rpm : 1200
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1060
 Rack travel in mm : 9.00...11.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 950
 Aneroid pressure h: 1000
 Del.quantity : 211.0...213.0
 1000 : (208.0...216.0)

Spread cm3 : 5.00
1000 : (8.00)

RATED SPEED

1st version
Control lever
position degrees: 117...125

Testing:
1st rack travel in: 10.30
Speed rpm : 990...1000
2nd rack travel in: 4.00
Speed rpm : 1045...1075
3rd rack travel in: 4.00
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 73...81

Testing:
Speed rpm : 100
Minimum rack travel: 6.60
Speed rpm : 300
Rack travel in mm : 4.30...4.50

CONSTANT REGULATION
Speed rpm : 320...440

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 1000
Rack travel mm : 11.30...11.40

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.20...10.40
2nd pressure hPa : 300
Rack travel in m: 11.00...11.10
3rd pressure hPa : 260
Rack travel in m: 10.50...10.70

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000
Speed rpm : 550
Del.quantity cm3/ : 215.0...221.0
1000 s: (212.0...224.0)
Aneroid pressure h: -

Speed rpm : 550
Del.quantity cm3/ : 184.0...186.0
1000 s: (181.0...189.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.30
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 135.0...165.0
1000 s: (131.0...169.0)

LOW IDLE

Speed rpm : 275
Rack travel in mm : 4.20...4.60
Del.quantity cm3/ : 19.0...25.0
1000 s: (16.0...28.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

:

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,
the start position must be reached.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 30.10.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 646 793
 Injection pump
 Pump designation : PE6P120A320LS7846
 EP type number : 0 412 626 865
 Governor
 Governor design. : RQ300/1050PA1030-8
 Governor no. : 0 421 801 673

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 213.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.30...12.40

Del.quantity cm³/ : 20.1...20.3

100 s: (19.8...20.6)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.3...5.9

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 800

Del.quantity : 201.0...203.0

1000 : (198.0...206.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.40

Speed rpm : 1090...1105
2nd rack travel in: 4.00
Speed rpm : 1165...1195
4th rack travel in: 1300
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.7

Testing:

Speed rpm : 200
Minimum rack travel: 8.00
Speed rpm : 300
Rack travel in mm : 5.60...5.80
Rack travel in mm : 2.00
Speed rpm : 360...400

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.90...10.20

Measurement

Speed 1/min : 500

1st pressure hPa : 200
Rack travel in m: 10.30...10.40
2nd pressure hPa : 450
Rack travel in m: 11.60...11.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 800
Speed rpm : 550
Del.quantity cm³/ : 199.0...203.0
1000 s: (196.0...206.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 126.0...128.0
1000 s: (123.0...131.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.40
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 23.10.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 646 794
 Injection pump
 Pump designation : PE6P120A320LS7858
 EP type number : 0 412 626 875
 Governor
 Governor design. : RQV300...1050PA1033-9
 Governor no. : 0 421 814 028

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 200.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00X1.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60
 : (5.45...5.65)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.70...11.80

Del. quantity cm³/ : 18.9...19.1

100 s: (18.6...19.4)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.3...5.9

Del. quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.6

100 s: (1.0)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
 travel mm : 0.50...1.00

2nd speed rpm : 575
 travel mm : 4.30...4.80

3rd speed rpm : 625
 travel mm : 4.80...5.30

4th speed rpm : 830
 travel mm : 5.90...6.40

5th speed rpm : 1109
 travel mm : 8.20...8.70

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1

Speed rpm : 1160

Rack travel in mm : 9.40...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1050

Aneroid pressure h: 800
Del. quantity : 189.0...191.0
1000 : (186.0...194.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 115...123

Testing:
1st rack travel in: 10.70
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1145...1175
4th rack travel in: 1300
Speed rpm : 0.00...1.50

LOW IDLE 1
Control lever
position degrees: 77...85

Testing:
Speed rpm : 200
Minimum rack travel: 8.50
Speed rpm : 300
Rack travel in mm : 5.50...5.70
Rack travel in mm : 2.00
Speed rpm : 380...420

CONSTANT REGULATION
Speed rpm : 300...400

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.70...10.00

Measurement
Speed 1/min : 500

1st pressure hPa : 200
Rack travel in m: 10.10...10.20
2nd pressure hPa : 350
Rack travel in m: 10.80...11.00

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 800
Speed rpm : 550
Del. quantity cm3/ : 181.0...185.0
1000 s: (178.0...188.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del. quantity cm3/ : 126.0...128.0
1000 s: (123.0...131.0)
Spread cm3 : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.70
Speed rpm : 1090...1100

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 21.09.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 646 795
 Injection pump
 Pump designation : PE6P120A320LS7858
 EP type number : 0 412 626 875
 Governor
 Governor design. : RQ300/1050PA1030-4
 Governor no. : 0 421 801 664

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 180.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60
 : (5.45...5.65)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1050
 Rack travel in mm : 11.10...11.20
 Del.quantity cm³/ : 17.0...17.2
 100 s: (16.7...17.5)
 Spread cm³ : 0.5
 100 s: (0.9)

2nd speed rpm : 300.0
 Rack travel in mm : 5.3...5.9
 Del.quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)
 Spread cm³ : 0.6
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 600
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1050
 Aneroid pressure h: 700
 Del.quantity : 170.0...172.0
 1000 : (167.0...175.0)
 Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
 Setting point:
 Speed rpm : 600
 Rack travel in mm : 20.0

Testing:

1st rack travel in: 10.10
Speed rpm : 1090...1105
2nd rack travel in: 4.00
Speed rpm : 1165...1195
4th rack travel in: 1300
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.6

Testing:

Speed rpm : 200
Minimum rack travel: 7.40
Speed rpm : 300
Rack travel in mm : 5.50...5.70
Rack travel in mm : 2.00
Speed rpm : 370...410

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.00...10.30

Measurement

Speed 1/min : 500

1st pressure hPa : 200
Rack travel in m: 10.10...10.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 550
Del.quantity cm3/ : 160.0...164.0
1000 s: (157.0...167.0)
Spread cm3 : 8.00
1000 s: (12.0)

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 130.0...132.0
1000 s: (127.0...135.0)
Spread cm3 : 8.00
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 10.10
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 50.0...80.0
1000 s: (46.0...84.0)
Rack travel in mm : 10.00...10.30

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 23.10.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 646 795
 Injection pump
 Pump designation : PE6P120A320LS7858
 EF type number : 0 412 626 875
 Governor
 Governor design. : RQV300...1050PA1033-
 8
 Governor no. : 0 421 814 027
 Customer-spec. information
 Customer : MERCEDES-BENZ
 Engine : OM401 LA
 1st version kw : 180.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 1 688 901 105
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,8
 Test lines : 1 680 750 075
 Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60
 : (5.45...5.65)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1050
 Rack travel in mm : 11.10...11.20
 Del. quantity cm³/ : 17.0...17.2
 100 s: (16.7...17.5)
 Spread cm³ : 0.5
 100 s: (0.9)

2nd speed rpm : 300.0
 Rack travel in mm : 5.3...5.9
 Del. quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)
 Spread cm³ : 0.6
 100 s: (1.0)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
 travel mm : 0.50...1.00
 2nd speed rpm : 575
 travel mm : 4.30...4.80
 3rd speed rpm : 625
 travel mm : 4.80...5.30
 4th speed rpm : 830
 travel mm : 5.90...6.40
 5th speed rpm : 1109
 travel mm : 8.20...8.70

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1170
 Rack travel in mm : 8.80...11.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1050

Aneroid pressure h: 700
Del.quantity : 170.0...172.0
1000 : (167.0...175.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 115...123

Testing:

1st rack travel in: 10.10
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1135...1165
4th rack travel in: 1300
Speed rpm : 0.00...1.50

LOW IDLE 1

Control lever
position degrees: 77...85

Testing:

Speed rpm : 200
Minimum rack travel: 8.50
Speed rpm : 300
Rack travel in mm : 5.50...5.70
Rack travel in mm : 2.00
Speed rpm : 380...420

CONSTANT REGULATION

Speed rpm : 300...400

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.10...10.20

Measurement

Speed 1/min : 500

1st pressure hPa : 200
Rack travel in m: 10.20...10.30

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 550
Del.quantity cm³/ : 160.0...164.0
1000 s: (157.0...167.0)
Spread cm³ : 8.00
1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm³/ : 130.0...132.0
1000 s: (127.0...135.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.10
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 50.0...80.0
1000 s: (46.0...84.0)
Rack travel in mm : 10.00...10.30

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 23.10.92
 Replaces : 09.92
 Test oil : ISO-4113
 Combination no. : 0 402 646 796
 Injection pump
 Pump designation : PE6P120A320LS7858
 EP type number : 0 412 626 875
 Governor
 Governor design. : RQ300/1050PA1030-5
 Governor no. : 0 421 801 665

Customer-spec. information
 Customer : MBERCEDES-BENZ

Engine : OM401 LA

1st version kW : 200.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60
 : (5.45...5.65)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.70...11.80

Del.quantity cm³/ : 18.9...19.1

100 s: (18.6...19.4)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.9...5.5

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 800

Del.quantity : 189.0...191.0

1000 : (186.0...194.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:
1st rack travel in: 10.70
Speed rpm : 1090...1105
2nd rack travel in: 4.00
Speed rpm : 1160...1190
4th rack travel in: 1300
Speed rpm : 0.00...1.50

LOW IDLE 1
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.2

Testing:
Speed rpm : 200
Minimum rack travel: 8.00
Speed rpm : 300
Rack travel in mm : 5.10...5.30
Rack travel in mm : 2.00
Speed rpm : 360...400

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.60...10.00

Measurement
Speed 1/min : 500

1st pressure hPa : 200
Rack travel in m: 10.00...10.10
2nd pressure hPa : 350
Rack travel in m: 10.70...10.90

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 800
Speed rpm : 550
Del.quantity cm3/ : 182.0...186.0
1000 s: (179.0...189.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 126.0...128.0
1000 s: (123.0...131.0)
Spread cm3 : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.70
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 45.0...65.0
1000 s: (41.0...69.0)
Rack travel in mm : 9.60...10.00

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 05.10.92
 Replaces : 08.92
 Test oil : ISO-4113
 Combination no. : 0 402 646 799
 Injection pump
 Pump designation : PE6P120A320LS7852
 EP type number : 0 412 626 871
 Governor
 Governor design. : RQ300/950PA1031-5
 Governor no. : 0 421 801 657

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Overflow
 quantity min. 1/h: 100...120
 Test nozzle holder
 assembly : 1 688 901 105
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,8
 Test lines : 1 680 750 075
 Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 3- 5- 2- 4- 1
 Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600
 Rack travel in mm : 14.00...14.10
 Del.quantity cm³/ : 23.4...23.6
 100 s: (23.1...23.9)
 Spread cm³ : 0.5
 100 s: (0.9)
 2nd speed rpm : 300.0
 Rack travel in mm : 5.6...6.2
 Del.quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)
 Spread cm³ : 0.6
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 600
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 600
 Aneroid pressure h: 1100
 Del.quantity : 234.0...236.0
 1000 : (231.0...239.0)
 Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
 Setting point:
 Speed rpm : 600
 Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.00
Speed rpm : 990...1005
2nd rack travel in: 4.00
Speed rpm : 1070...1100
4th rack travel in: 1300
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.9

Testing:

Speed rpm : 200
Minimum rack travel: 8.10
Speed rpm : 300
Rack travel in mm : 5.80...6.00
Rack travel in mm : 2.00
Speed rpm : 380...420

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.10...10.40

Measurement

Speed 1/min : 500

1st pressure hPa : 300
Rack travel in m: 10.80...10.90
2nd pressure hPa : 700
Rack travel in m: 12.90...13.10

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1100
Speed rpm : 950
Del.quantity cm³/ : 228.0...232.0
1000 s: (225.0...235.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 132.0...134.0
1000 s: (129.0...137.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 13.00
Speed rpm : 990...1005

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 h3
 Edition : 21.09.92
 Replaces : 01.91
 Test oil : ISO-4113
 Combination no. : 0 402 746 887
 Injection pump
 Pump designation : PES6P120A72DRS7200
 EP type number : 0 412 726 833
 Governor
 Governor design. : RQV325...975PA944-2K
 Governor no. : 0 421 815 237

Customer-spec. information
 Customer : MACK TRUCKS

Engine : E7-300A

1st version kw : 224.0
 Rated speed : 1950
 2nd version kw : 224.0
 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 11.00...13.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 975
 Rack travel in mm : 13.00...13.10
 Del.quantity cm³/ : 21.8...22.0
 100 s: (21.5...22.3)
 Spread cm³ : 0.5
 100 s: (0.9)

2nd speed rpm : 340.0
 Rack travel in mm : 4.8...5.0
 Del.quantity cm³/ : 3.1...3.7
 100 s: (2.9...3.9)
 Spread cm³ : 0.8
 100 s: (1.2)

1st speed rpm : 975
 Rack travel in mm : 13.0...13.1
 Del.quantity cm³/ : 22.5...22.7
 100 s: (22.2...23.0)
 Spread cm³ : 0.5
 100 s: (0.9)
 2nd speed rpm : 340
 Rack travel in mm : 4.8...5.0
 Del.quantity cm³/ : 3.1...3.7
 100 s: (2.9...3.9)
 Spread cm³ : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.40...1.60
 2nd speed rpm : 450
 travel mm : 2.80...3.20
 3rd speed rpm : 950
 travel mm : 7.90...8.10

4th speed rpm : 1200
travel mm : 10.20...10.60

GUIDE SLEEVE POSITION
Control-lever position
Degree: -1

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 975
Aneroid pressure h: 1200
Del. quantity : 218.5...220.5
1000 : (215.5...223.5)
Spread cm³ : 5.00
1000 : (9.00)

2nd version

Speed rpm : 975
Aneroid pressure h: 1200
Del. quantity cm³/ : 225.0...227.0
1000 s: (222.0...230.0)
Spread cm³ : 5.00
1000 s: (9.00)

RATED SPEED

1st version

Control lever
position degrees: 57...65

Testing:

1st rack travel in: 12.00
Speed rpm : 1015...1045
2nd rack travel in: 4.00
Speed rpm : 1180...1190
3rd rack travel in: 4.00
4th rack travel in: 1300
Speed rpm : 0.00...1.00

2nd version

Control lever
position degrees: 57...65

Testing:

1st rack travel in: 12.00
Speed rpm : 1015...1045
2nd rack travel in: 4.00
Speed rpm : 1180...1190
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 8...16

Testing:

Speed rpm : 275
Minimum rack travel: 6.00
Speed rpm : 340
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 975
Rack travel in m: 13.00...13.10
2nd speed rpm : 600
Rack travel in m: 12.20...12.40
3rd speed rpm : 500
Rack travel in m: 11.20...11.60

Torque control curve - 2nd version

1st speed rpm : 975
Rack travel in m: 13.0...13.1
2nd speed rpm : 600
Rack travel in m: 12.2...12.4
3rd speed rpm : 500
Rack travel in m: 11.2...11.6

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 975
Pressure hPa : 1200
Rack travel mm : 13.00...13.10

Measurement

Speed 1/min : 975
1st pressure hPa : -
Rack travel in m: 8.00...8.40
2nd pressure hPa : 325
Rack travel in m: 9.40...9.50
3rd pressure hPa : 640
Rack travel in m: 11.70...12.10

2th version

Setting
Speed rpm : 975
Pressure hPa : 1200
Rack travel in mm : 13.0...13.1

Measurement

Speed rpm : 975
1st pressure hPa : -
Rack travel in m: 8.00...8.40
2nd pressure hPa : 325
Rack travel in m: 9.40...9.50
3rd pressure hPa : 640
Rack travel in m: 11.7...12.1

START CUT-OUT

Speed 1/min : 250 (255)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 600
Del.quantity cm³/ : 238.5...244.5
1000 s: (235.5...247.5)
Spread cm³ : 8.00
1000 s: (12.)
Speed rpm : 875
Del.quantity cm³/ : 199.0...201.0 *
1000 s: (180.5...207.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 149.0...153.0
1000 s: (147.0...155.0)

2nd version

Aneroid pressure h: 1200
Speed rpm : 600
Del.quantity cm³/ : 240.5...246.5
1000 s: (237.5...249.5)
Spread cm³ : 8.00
1000 s: (12.0)
Speed rpm : 875
Del.quantity cm³/ : 199.0...201.0 *
1000 s: (180.5...207.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 149.0...153.0
1000 s: (147.0...155.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.00
Speed rpm : 1015...1045

2nd version

1mm rack travel less than
full load rack tr: 12.00
Speed rpm : 1015...1045

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 19.00...21.00

Speed rpm : 100
Del.quantity cm³/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 19.0...21.0

B23

LOW IDLE

Speed rpm : 340
Rack travel in mm : 4.80...5.00
Del.quantity cm³/ : 31.0...37.0
1000 s: (29.0...39.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P8

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm
* This test specification applies only
to the engine/nozzle-and-holder
assemblies on an injection-pump test
bench: setting for test equipment,
check value for engine equipment.

Test specifications for versions 1
only apply to injection pumps with
constant-pressure valve 2 418 559 029
and spring 2 414 612 005.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 h
 Edition : 21.09.92
 Replaces : 12.90
 Test oil : ISO-4113

Combination no. : 0 402 746 890

Injection pump
 Pump designation : PES6P120A72ORS7200
 EP type number : 0 412 726 833
 Governor
 Governor design. : RQV325...875PA944-5K
 Governor no. : 0 421 815 240

Customer-spec. information
 Customer : MACK TRUCKS

Engine : EM7-275

1st version kW : 202.0
 Rated speed : 1750
 2nd version kW : 202.0
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.25...3.35
 : (3.20...3.40)
 Rack travel in mm : 11.00...13.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 13.20...13.30

Del.quantity cm³/ : 23.4...23.6

100 s: (23.1...23.9)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 340.0

Rack travel in mm : 4.6...4.8

Del.quantity cm³/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm³ : 0.8

100 s: (1.2)

1st speed rpm : 875

Rack travel in mm : 13.2...13.3

Del.quantity cm³/ : 23.5...23.7

100 s: (23.2...24.0)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 340

Rack travel in mm : 4.6...4.8

Del.quantity cm³/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.40...1.60

2nd speed rpm : 450

travel mm : 3.30...3.70

3rd speed rpm : 700

travel mm : 7.90...8.30

4th speed rpm : 900
travel mm : 9.40...9.60
5th speed rpm : 1050
travel mm : 10.60...11.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875
Aneroid pressure h: 1200
Del. quantity : 234.0...236.0
1000 : (231.0...239.0)
Spread cm³ : 5.00
1000 : (9.00)

2nd version

Speed rpm : 875
Aneroid pressure h: 1200
Del. quantity cm³/ : 235.5...237.5
1000 s: (232.5...240.5)
Spread cm³ : 5.00
1000 s: (9.00)

RATED SPEED

1st version

Control lever
position degrees: 60...68

Testing:

1st rack travel in: 12.20
Speed rpm : 915...945
2nd rack travel in: 4.00
Speed rpm : 1065...1075
4th rack travel in: 1200
Speed rpm : 0.00...1.00

2nd version

Control lever
position degrees: 60...68

Testing:

1st rack travel in: 12.20
Speed rpm : 915...945
2nd rack travel in: 4.00
Speed rpm : 1065...1075
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 8...16

Testing:

Speed rpm : 275
Minimum rack travel: 6.00
Speed rpm : 340
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION

Speed rpm : 325...520

B25

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 13.20...13.30
2nd speed rpm : 510
Rack travel in m: 13.80...14.00
3rd speed rpm : 600
Rack travel in m: 13.80...14.00
4th speed rpm : 450
Rack travel in m: 12.90...13.30

Torque control curve - 2nd version

1st speed rpm : 875
Rack travel in m: 13.2...13.3
2nd speed rpm : 510
Rack travel in m: 13.8...14.0
3rd speed rpm : 600
Rack travel in m: 13.8...14.0
4th speed rpm : 450
Rack travel in m: 12.9...13.3

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel mm : 13.80...14.00

Measurement

Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 8.40...8.80
2nd pressure hPa : 310
Rack travel in m: 10.10...10.20
3rd pressure hPa : 635
Rack travel in m: 12.60...13.00

2th version

Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel in mm : 13.8...14.0

Measurement

Speed rpm : 510

1st pressure hPa : -
Rack travel in m: 8.40...8.80
2nd pressure hPa : 310
Rack travel in m: 10.1...10.2
3rd pressure hPa : 635
Rack travel in m: 12.6...13.0

START CUT-OUT

Speed 1/min : 250 (255)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm³/ : 311.0...317.0
1000 s: (308.0...320.0)
Spread cm³ : 8.00
1000 s: (12.0)
Speed rpm : 875
Del.quantity cm³/ : 199.0...201.0 *
1000 s: (150.0...172.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 155.5...159.5
1000 s: (153.5...161.5)

2nd version

Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm³/ : 311.0...317.0
1000 s: (308.0...320.0)
Spread cm³ : 8.00
1000 s: (12.0)
Speed rpm : 875
Del.quantity cm³/ : 199.0...201.0 *
1000 s: (150.0...172.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 155.5...159.5
1000 s: (153.5...161.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.20
Speed rpm : 915...945

2nd version

1mm rack travel less than
full load rack tr: 12.20
Speed rpm : 915...945

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 19.00...21.00

Speed rpm : 100
Del.quantity cm³/ : 170.0...210.0
1000 s: (160.0...220.0)

Rack travel in mm : 19.00...21.0

LOW IDLE

Speed rpm : 340
Rack travel in mm : 4.60...4.80
Del.quantity cm³/ : 31.0...37.0
1000 s: (29.0...39.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P4

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm
* This test specification applies only
to the engine/nozzle-and-holder
assemblies on an injection-pump test
bench: setting for test equipment,
check value for engine equipment.

Test specifications for versions 1
only apply to injection pumps with
constant-pressure valve 2 418 559 029
and spring 2 414 612 005.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 h4
 Edition : 21.09.92
 Replaces : 01.91
 Test oil : ISO-4113
 Combination no. : 0 402 746 891
 Injection pump
 Pump designation : PES6P120A720RS7200
 EP type number : 0 412 725 833
 Governor
 Governor design. : RQV325...875PA944-6K
 Governor no. : 0 421 815 241

Customer-spec. information
 Customer : MACK TRUCKS

Engine : EM7-250

1st version kW : 187.0
 Rated speed : 1750
 2nd version kW : 187.0
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 2 417 413 011

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.25...3.35
 : (3.20...3.40)
 Rack travel in mm : 11.00...13.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 12.50...12.60

Del. quantity cm³/ : 21.3...21.5

100 s: (21.0...21.8)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 340.0

Rack travel in mm : 4.6...4.8

Del. quantity cm³/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm³ : 0.8

100 s: (1.2)

1st speed rpm : 875

Rack travel in mm : 12.5...12.6

Del. quantity cm³/ : 21.5...21.7

100 s: (21.2...22.0)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 340

Rack travel in mm : 4.60...4.80

Del. quantity cm³/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.40...1.60

2nd speed rpm : 450

travel mm : 3.30...3.70

3rd speed rpm : 700

travel mm : 7.90...8.30

4th speed rpm : 900
travel mm : 9.40...9.60
5th speed rpm : 1050
travel mm : 10.60...11.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 875
Aneroid pressure h : 1200
Del. quantity : 213.0...215.0
1000 : (210.0...218.0)
Spread cm³ : 5.00
1000 : (9.00)

2nd version
Speed rpm : 875
Aneroid pressure h : 1200
Del. quantity cm³/ : 215.0...217.0
1000 s : (212.0...220.0)
Spread cm³ : 5.00
1000 s : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 62...70

Testing:
1st rack travel in: 11.50
Speed rpm : 915...945
2nd rack travel in: 4.00
Speed rpm : 1045...1055
4th rack travel in: 1200
Speed rpm : 0.00...1.00

2nd version
Control lever
position degrees: 62...70

Testing:
1st rack travel in: 11.50
Speed rpm : 915...945
2nd rack travel in: 4.00
Speed rpm : 1045...1055
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 8...16

Testing:
Speed rpm : 275
Minimum rack travel: 6.00
Speed rpm : 340
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 12.50...12.60
2nd speed rpm : 510
Rack travel in m: 13.40...13.60
3rd speed rpm : 600
Rack travel in m: 13.40...13.60
4th speed rpm : 450
Rack travel in m: 12.60...13.00

Torque control curve - 2nd version
1st speed rpm : 875
Rack travel in m: 12.5...12.6
2nd speed rpm : 510
Rack travel in m: 13.4...13.6
3rd speed rpm : 600
Rack travel in m: 13.4...13.6
4th speed rpm : 450
Rack travel in m: 12.6...13.0

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel mm : 13.40...13.60

Measurement
Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 8.50...8.90
2nd pressure hPa : 285
Rack travel in m: 10.00...10.10
3rd pressure hPa : 570
Rack travel in m: 12.30...12.70

2th version
Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel in mm : 13.4...13.6

Measurement
Speed rpm : 510

1st pressure hPa : -
Rack travel in m: 8.50...8.90
2nd pressure hPa : 285
Rack travel in m: 10.0...10.1
3rd pressure hPa : 570
Rack travel in m: 12.3...12.7

START CUT-OUT

Speed 1/min : 250 (255)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm³/ : 291.5...297.5
1000 s: (288.5...300.5)
Spread cm³ : 8.00
1000 s: (12.0)

Speed rpm : 875
Del.quantity cm³/ : 199.0...201.0
1000 s: (150.0...172.0)

Aneroid pressure h: -

Speed rpm : 400
Del.quantity cm³/ : 153.0...157.0
1000 s: (151.0...159.0)

2nd version

Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm³/ : 291.5...297.5
1000 s: (288.5...300.5)
Spread cm³ : 8.00
1000 s: (12.0)

Speed rpm : 875
Del.quantity cm³/ : 199.0...201.0 *
1000 s: (150.0...172.0)

Aneroid pressure h: -

Speed rpm : 400
Del.quantity cm³/ : 153.0...157.0
1000 s: (151.0...159.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.50
Speed rpm : 915...945

2nd version

1mm rack travel less than
full load rack tr: 11.50
Speed rpm : 915...945

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 19.00...21.00

Speed rpm : 100
Del.quantity cm³/ : 170.0...210.0
1000 s: (160.0...220.0)

Rack travel in mm : 19.0...21.0

LOW IDLE

Speed rpm : 340
Rack travel in mm : 4.60...4.80
Del.quantity cm³/ : 31.0...37.0
1000 s: (29.0...39.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

: MACK # 313G05188-P2

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm
* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment.

Test specifications for versions 1 only apply to injection pumps with constant-pressure valve 2 418 559 029 and spring 2 414 612 005.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 h5
 Edition : 21.09.92
 Replaces : 01.91
 Test oil : ISO-4113

Combination no. : 0 402 746 892

Injection pump
 Pump designation : PES6P120A72DRS7200
 EP type number : 0 412 726 833
 Governor
 Governor design. : RQV325...975PA944-7K
 Governor no. : 0 421 815 242

Customer-spec. information
 Customer : MACK TRUCKS

Engine : E7-250A

1st version kW : 180.0
 Rated speed : 1950
 2nd version kW : 180.0
 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow quantity min. 1/h: 160...170

Test nozzle holder assembly : 1 688 901 101

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.25...3.35
 : (3.20...3.40)
 Rack travel in mm : 11.00...13.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 975

Rack travel in mm : 12.30...12.40

Del.quantity cm³/ : 20.2...20.4
 100 s: (19.9...20.7)

Spread cm³ : 0.5
 100 s: (0.9)

2nd speed rpm : 340.0
 Rack travel in mm : 4.8...5.0
 Del.quantity cm³/ : 3.1...3.7
 100 s: (2.9...3.9)
 Spread cm³ : 0.8
 100 s: (1.2)

1st speed rpm : 975
 Rack travel in mm : 12.3...12.4
 Del.quantity cm³/ : 20.5...20.7
 100 s: (20.2...21.0)
 Spread cm³ : 0.5
 100 s: (0.9)

2nd speed rpm : 340
 Rack travel in mm : 4.80...5.00
 Del.quantity cm³/ : 3.1...3.7
 100 s: (2.9...3.9)
 Spread cm³ : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.40...1.60
 2nd speed rpm : 450
 travel mm : 2.80...3.20
 3rd speed rpm : 950
 travel mm : 7.90...8.10

4th speed rpm : 1200
travel mm : 10.20...10.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 975
Aneroid pressure h: 1200
Del. quantity : 202.0...204.0
1000 : (199.0...207.0)
Spread cm³ : 5.00
1000 : (9.00)

2nd version

Speed rpm : 975
Aneroid pressure h: 1200
Del. quantity cm³/ : 205.5...207.5
1000 s: (202.5...210.5)
Spread cm³ : 5.00
1000 s: (9.00)

RATED SPEED

1st version

Control lever
position degrees: 57...65

Testing:

1st rack travel in: 11.30
Speed rpm : 1015...1045
2nd rack travel in: 4.00
Speed rpm : 1175...1185
4th rack travel in: 1300
Speed rpm : 0.00...1.00

2nd version

Control lever
position degrees: 57...65

Testing:

1st rack travel in: 11.30
Speed rpm : 1015...1045
2nd rack travel in: 4.00
Speed rpm : 1175...1185
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 8...16

Testing:

Speed rpm : 275
Minimum rack travel: 6.00
Speed rpm : 340
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

CO3

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 975
Rack travel in m: 12.30...12.40
2nd speed rpm : 600
Rack travel in m: 12.10...12.30
3rd speed rpm : 800
Rack travel in m: 12.30...12.50
4th speed rpm : 500
Rack travel in m: 11.40...11.80

Torque control curve - 2nd version

1st speed rpm : 975
Rack travel in m: 12.3...12.4
2nd speed rpm : 600
Rack travel in m: 12.1...12.3
3rd speed rpm : 800
Rack travel in m: 12.3...12.5
4th speed rpm : 500
Rack travel in m: 11.4...11.8

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 975
Pressure hPa : 1200
Rack travel mm : 12.30...12.40

Measurement

Speed 1/min : 975

1st pressure hPa : -

Rack travel in m: 8.50...8.90

2nd pressure hPa : 330

Rack travel in m: 9.70...9.80

3rd pressure hPa : 570

Rack travel in m: 11.40...11.80

2th version

Setting

Speed rpm : 975
Pressure hPa : 1200
Rack travel in mm : 12.3...12.4

Measurement

Speed rpm : 975

1st pressure hPa : -

Rack travel in m: 8.50...8.90

2nd pressure hPa : 330

Rack travel in m: 9.70...9.80

3rd pressure hPa : 570

Rack travel in m: 11.4...11.8

START CUT-OUT

Speed 1/min : 250 (255)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 600
Del.quantity cm³/ : 233.0...239.0
1000 s: (230.0...242.0)
Spread cm³ : 8.00
1000 s: (12.0)
Speed rpm : 875
Del.quantity cm³/ : 199.0...201.0 *
1000 s: (150.0...172.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 154.0...158.0
1000 s: (152.0...160.0)

2nd version

Aneroid pressure h: 1200
Speed rpm : 600
Del.quantity cm³/ : 233.0...239.0
1000 s: (230.0...242.0)
Spread cm³ : 8.00
1000 s: (12.0)
Speed rpm : 875
Del.quantity cm³/ : 199.0...201.0 *
1000 s: (150.0...172.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 154.0...158.0
1000 s: (152.0...160.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 11.30
Speed rpm : 1015...1045

2nd version

1mm rack travel less than
full load rack tr: 11.30
Speed rpm : 1015...1045

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 19.00...21.00

Speed rpm : 100
Del.quantity cm³/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 19.0...21.0

LOW IDLE

Speed rpm : 340
Rack travel in mm : 4.80...5.00
Del.quantity cm³/ : 31.0...37.0
1000 s: (29.0...39.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P6

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm
* This test specification applies only
to the engine/nozzle-and-holder
assemblies on an injection-pump test
bench: setting for test equipment,
check value for engine equipment.

Test specifications for versions 1
only apply to injection pumps with
constant-pressure valve 2 418 559 029
and spring 2 414 612 005.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 h2
 Edition : 21.09.92
 Replaces : 02.91
 Test oil : ISO-4113
 Combination no. : 0 402 746 896
 Injection pump
 Pump designation : PES6P120A720RS7200
 EP type number : 0 412 726 833
 Governor
 Governor design. : RQV325...900PA944-11
 K
 Governor no. : 0 421 815 260

Customer-spec. information
 Customer : MACK TRUCKS

Engine : E7-350
 1st version kW : 261.0
 Rated speed : 1800
 2nd version kW : 261.0
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42
 Overflow valve : 2 417 413 011

Overflow quantity min. 1/h: 160...170

Test nozzle holder assembly : 1 688 901 101

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant. per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24
 Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 11.00...13.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 14.50...14.60

Del. quantity cm³/ : 27.1...27.3

100 s: (26.8...27.6)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 340.0

Rack travel in mm : 4.6...4.8

Del. quantity cm³/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm³ : 0.8

100 s: (1.2)

1st speed rpm : 900

Rack travel in mm : 14.5...14.6

Del. quantity cm³/ : 27.7...27.9

100 s: (27.4...28.2)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 340

Rack travel in mm : 4.60...4.80

Del. quantity cm³/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.40...1.60

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 700

travel mm : 6.00...6.40
4th speed rpm : 900
travel mm : 8.50...8.70
5th speed rpm : 1050
travel mm : 9.80...10.20

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900
Aneroid pressure h: 1200
Del. quantity : 271.0...273.0
1000 : (268.0...276.0)
Spread cm3 : 5.00
1000 : (9.00)

2nd version

Speed rpm : 900
Aneroid pressure h: 1200
Del. quantity cm3/ : 277.5...279.5
1000 s: (274.5...282.5)
Spread cm3 : 5.00
1000 s: (9.00)

RATED SPEED

1st version

Control lever
position degrees: 59...67

Testing:

1st rack travel in: 13.50
Speed rpm : 940...990
2nd rack travel in: 4.00
Speed rpm : 1115...1125
4th rack travel in: 1200
Speed rpm : 0.00...1.00

2nd version

Control lever
position degrees: 59...67

Testing:

1st rack travel in: 13.50
Speed rpm : 940...990
2nd rack travel in: 4.00
Speed rpm : 1115...1125
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 8...16

Testing:

Speed rpm : 275
Minimum rack travel: 6.00
Speed rpm : 340
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION

CO6

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 900
Rack travel in m: 14.50...14.60
2nd speed rpm : 625
Rack travel in m: 13.80...14.00
3rd speed rpm : 675
Rack travel in m: 13.80...14.00
4th speed rpm : 500
Rack travel in m: 11.90...12.70

Torque control curve - 2nd version

1st speed rpm : 900
Rack travel in m: 14.5...14.6
2nd speed rpm : 625
Rack travel in m: 13.8...14.0
3rd speed rpm : 675
Rack travel in m: 13.8...14.0
4th speed rpm : 500
Rack travel in m: 11.9...12.7

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 900
Pressure hPa : 1200
Rack travel mm : 14.50...14.60

Measurement

Speed 1/min : 900

1st pressure hPa : -
Rack travel in m: 7.90...8.30
2nd pressure hPa : 400
Rack travel in m: 9.80...9.90
3rd pressure hPa : 775
Rack travel in m: 12.60...13.00

2th version

Setting
Speed rpm : 900
Pressure hPa : 1200
Rack travel in mm : 14.5...14.6

Measurement

Speed rpm : 900

1st pressure hPa : -
Rack travel in m: 8.10...8.50
2nd pressure hPa : 400
Rack travel in m: 9.80...9.90
3rd pressure hPa : 775
Rack travel in m: 12.6...13.0

START CUT-OUT

Speed 1/min : 250 (255)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 625
Del.quantity cm³/ : 290.0...296.0
1000 s: (287.0...299.0)
Spread cm³ : 8.00
1000 s: (12.0)
Speed rpm : 875
Del.quantity cm³/ : 199.0...201.0 *
1000 s: (180.5...207.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 150.0...154.0
1000 s: (148.0...156.0)

2nd version

Aneroid pressure h: 1200
Speed rpm : 625
Del.quantity cm³/ : 290.0...296.0
1000 s: (287.0...299.0)
Spread cm³ : 8.00
1000 s: (12.0)
Speed rpm : 875
Del.quantity cm³/ : 199.0...201.0 *
1000 s: (180.5...207.5)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 150.0...154.0
1000 s: (148.0...156.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.50
Speed rpm : 940...990

2nd version

1mm rack travel less than

full load rack tr: 13.50
Speed rpm : 940...990

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 19.00...21.00

Speed rpm : 100

Del.quantity cm³/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 19.0...21.0

LOW IDLE

Speed rpm : 340
Rack travel in mm : 4.60...4.80
Del.quantity cm³/ : 31.0...37.0
1000 s: (29.0...39.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P12

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm

* This test specification applies only
to the engine/nozzle-and-holder
assemblies on an injection-pump test
bench: setting for test equipment,
check value for engine equipment.

Test specifications for versions 1
only apply to injection pumps with
constant-pressure valve 2 418 559 029
and spring 2 414 612 005.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 h1
 Edition : 21.09.92
 Replaces : 02.91
 Test oil : ISO-4113

Combination no. : 0 402 746 897

Injection pump
 Pump designation : PES6P12DA72ORS7200
 EP type number : 0 412 726 833
 Governor
 Governor design. : RQV325...875PA944-12
 K
 Governor no. : 0 421 815 261

Customer-spec. information
 Customer : MACK TRUCKS

Engine : EM7-300

1st version kW : 224.0
 Rated speed : 1750
 2nd version kW : 224.0
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 2 417 413 011

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.25...3.35
 : (3.20...3.40)

Rack travel in mm : 11.00...13.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ' : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 14.20...14.30

Del. quantity cm³/ : 25.3...25.5
 100 s: (25.0...25.8)

Spread cm³ : 0.5
 100 s: (0.9)

2nd speed rpm : 340.0
 Rack travel in mm : 4.6...4.8
 Del. quantity cm³/ : 3.1...3.7
 100 s: (2.9...3.9)

Spread cm³ : 0.8
 100 s: (1.2)

1st speed rpm : 875
 Rack travel in mm : 14.0...14.1
 Del. quantity cm³/ : 25.0...25.2
 100 s: (24.7...25.5)

Spread cm³ : 0.5
 100 s: (0.9)

2nd speed rpm : 340
 Rack travel in mm : 4.6...4.8
 Del. quantity cm³/ : 3.1...3.7
 100 s: (2.9...3.9)

Spread cm³ : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.40...1.60

2nd speed rpm : 450
 travel mm : 3.30...3.70

3rd speed rpm : 700

travel mm : 7.90...8.30
4th speed rpm : 900
travel mm : 9.40...9.60
5th speed rpm : 1050
travel mm : 10.60...11.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875
Aneroid pressure h: 1200
Del. quantity : 253.5...255.5
1000 : (250.5...258.5)
Spread cm³ : 5.00
1000 : (9.00)

2nd version

Speed rpm : 875
Aneroid pressure h: 1200
Del. quantity cm³ : 250.0...255.0
1000 s: (247.0...255.0)
Spread cm³ : 5.00
1000 s: (9.00)

RATED SPEED

1st version

Control lever
position degrees: 61...69

Testing:

1st rack travel in: 13.20
Speed rpm : 915...965
2nd rack travel in: 4.00
Speed rpm : 1075...1085
4th rack travel in: 1200
Speed rpm : 0.00...1.00

2nd version

Control lever
position degrees: 61...69

Testing:

1st rack travel in: 13.00
Speed rpm : 915...965
2nd rack travel in: 4.00
Speed rpm : 1075...1085
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 8...16

Testing:

Speed rpm : 275
Minimum rack travel: 6.00
Speed rpm : 340
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION

C09

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 14.20...14.30
2nd speed rpm : 510
Rack travel in m: 14.80...15.00
3rd speed rpm : 575
Rack travel in m: 14.80...15.00
4th speed rpm : 450
Rack travel in m: 13.90...14.30

Torque control curve - 2nd version

1st speed rpm : 875
Rack travel in m: 14.0...14.1
2nd speed rpm : 510
Rack travel in m: 14.7...14.9
3rd speed rpm : 575
Rack travel in m: 14.7...14.9
4th speed rpm : 450
Rack travel in m: 13.9...14.3

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel mm : 14.80...15.00

Measurement

Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 8.70...9.10
2nd pressure hPa : 370
Rack travel in m: 10.30...10.40
3rd pressure hPa : 760
Rack travel in m: 13.30...13.70

2th version

Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel in mm : 14.7...14.9

Measurement

Speed rpm : 510

1st pressure hPa : -
Rack travel in m: 8.70...9.10
2nd pressure hPa : 370
Rack travel in m: 10.3...10.4
3rd pressure hPa : 760
Rack travel in m: 13.3...13.7

START CUT-OUT

Speed 1/min : 250 (255)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 510

Del.quantity cm³/ : 334.0...340.0

1000 s: (331.0...343.0)

Spread cm³ : 8.00

1000 s: (12.0)

Speed rpm : 875

Del.quantity cm³/ : 199.0...201.0 *

1000 s: (159.5...183.0)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm³/ : 156.0...160.0

1000 s: (154.0...162.0)

2nd version

Aneroid pressure h: 1200

Speed rpm : 510

Del.quantity cm³/ : 328.0...334.0

1000 s: (325.0...337.0)

Spread cm³ : 8.00

1000 s: (12.0)

Speed rpm : 875

Del.quantity cm³/ : 199.0...201.0 *

1000 s: (159.5...183.0)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm³/ : 156.0...160.0

1000 s: (154.0...162.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.20

Speed rpm : 915...965

2nd version

1mm rack travel less than

full load rack tr: 13.00

Speed rpm : 915...965

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm³/ : 190.0...230.0

1000 s: (180.0...240.0)

Rack travel in mm : 19.00...21.00

Speed rpm : 100

Del.quantity cm³/ : 190.0...230.0

1000 s: (180.0...240.0)

Rack travel in mm : 19.0...21.0

LOW IDLE

Speed rpm : 340

Rack travel in mm : 4.60...4.80

Del.quantity cm³/ : 31.0...37.0

1000 s: (29.0...39.0)

Spread cm³ : 8.00

1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P10

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm

* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment.

Test specifications for versions 1 only apply to injection pumps with constant-pressure valve 2 418 559 029 and spring 2 414 612 005.

INJ.-PUMP TEST SPECIFICATIONS

inst. in remarks column

sheet : S0F
 n : 11.11.92
 es : 02.07.92
 ating oil : ISO-4113
 ion pump : VE4/11F2000R342
 umber : 0 460 414 067
 er Part-No. :

er-specific information
 er : S0FIM

: 8140.07.2700

ENCH REQUIREMENTS

ating-oil
 temp. °C
 hermometer : 40.00...48.00
 onically : 42.00...50.00

press., bar : 0.30...0.40

ating nozzle-holder
 ly : 1 688 901 027

g
 re bar: 250.00...253.00

ated-plate
 er mm: 0.5

nj. tubing : 1 680 750 073

e diameter : 6.00
 thickness : 2.00
 th mm: 450

of delivery
 oke mm: 0.3
 (from BDC): (+-0.02(0.04))

ion-pump setting values
 pecifications in parentheses

-device travel

1/min: 1100
 g value mm: 3.10...3.50
 f
 omagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1100
 Setting value bar: 5.70...6.30
 Shutoff
 electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 525
 Del. quantity cm³/
 1000S.: 27.00...28.00 F

Shutoff
 electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1100
 Del. quantity cm³/
 1000S.: 54.00...55.00 E

Shutoff
 electromagnet Volt: 12
 Dispersion cm³/: 3.5
 1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 350
 Del. quantity cm³/
 1000S.: 10.50...14.50

Shutoff
 electromagnet Volt: 12
 Del. quantity cm³/: 3.0
 1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 2300
 Del. quantity cm³/
 1000S.: 18.00...22.00

Shutoff
 electromagnet Volt: 12

Start:

Speed 1/min: 100
 Del. quantity cm³/: 40.00...80.00
 mind 1000S.: 40.00

Shutoff
 electromagnet Volt: 12

Load-dependent start of delivery:
 Inj.-qty.dif.measurement:

Speed 1/min: 1100
 Charge press hPa: 12
 Inj.-qty. cm³/
 difference 1000S.: 13.30...15.30 #
 Shutoff
 electromagnet Volt: 12

SP press.-dif.measurement

pompa di mandata (FP)

1.Speed 1/min: 1100

Supply pump

pressure

difference bar: 0.10...0.30#

Shutoff

electromagnet Volt: 12

Inspection-pump test specifications

Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1500

TD travel mm: 4.10...4.90

mm: (3.90...5.10)

Shutoff

electromagnet Volt: 12

3rd speed 1/min: 1100

TD travel mm: 3.10...3.50

mm: (2.70...3.90)

Shutoff

electromagnet Volt: 12

4th speed 1/min: 600

TD travel mm: 0.60...1.40

mm: (0.40...1.60)

Shutoff

electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 600

Supply-pump

pressure

bar: 4.10...4.70

Shutoff

electromagnet Volt: 12

2nd speed 1/min: 1100

Supply-pump

pressure

bar: 5.70...6.30

Shutoff

electromagnet Volt: 12

3rd speed 1/min: 1500

Supply-pump

pressure

bar: 6.90...7.50

Shutoff

electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 525

Shutoff

electromagnet Volt: 12

Overflow quantity cm³/10s: 69.50...111.20

(55.50...125.20)

2nd speed 1/min: 2000

Shutoff

electromagnet Volt: 12

Overflow quantity cm³/10s: 83.40...180.70

(69.40...194.70)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2450

Shutoff

electromagnet Volt: 12

Del. quantity cm³/: 0.00...5.00

1000S.: -

5th speed 1/min: 2300

Shutoff

electromagnet Volt: 12

Del. quantity cm³/: 18.00...22.00

1000S.: (15.50...24.50)

8th speed 1/min: 2200

Shutoff

electromagnet Volt: 12

Del. quantity cm³/: 32.00...40.00

1000S.: (30.00...42.00)

9th speed 1/min: 2000

Shutoff

electromagnet Volt: 12

Del. quantity cm³/: 48.00...53.00

1000S.: (47.00...54.00) D

10th speed 1/min: 1500

Shutoff

electromagnet Volt: 12

Del. quantity cm³/: 53.20...58.20

1000S.: (52.20...59.20)

12th speed 1/min: 525

Shutoff

electromagnet Volt: 12

Del. quantity cm³/: 27.00...28.00

1000S.: (24.00...31.00) F

18th speed 1/min: 1100

Shutoff

electromagnet Volt: 12

Del. quantity cm³/: 54.00...55.00

1000S.: (51.00...58.00) E

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 350

Del. quantity cm³/: 0.00...3.00

1000S.: -

Idle delivery:

1st speed 1/min: 350

Shutoff

electromagnet Volt: 12

Del. quantity cm³/: 10.50...14.50

1000S.: (8.50...16.50)

Dispersion cm³/: 3.0

1000S.: (3.5)

2nd speed 1/min: 600

Shutoff

electromagnet Volt: 12

Del. quantity cm³/: 0.00...2.00
1000S.: -
3rd speed 1/min: 400
Shutoff
electromagnet Volt: 12
Del. quantity cm³/: 0.00...5.00
1000S.: -
5th speed 1/min: 300
Shutoff
electromagnet Volt: 12
Del. quantity cm³/: 26.00...36.00
1000S.: (25.00...37.00)

Load-dependent start of delivery:
Inj.-qty.dif.measurement:

3rd speed 1/min: 1100
Inj.-qty. cm³/: 16.5...24.5 *
difference 1000S.: -
Shutoff
electromagnet Volt: 12
5th speed 1/min: 1100
Inj.-qty. cm³/: MAX. ..8.00 "
Shutoff
electromagnet Volt: 12

TD-travel dif.measurement:
correttore anticipo iniezione (SV):
1st speed 1/min: 1100
TD-travel : 0.40...0.60 *
difference mm: -
Shutoff
electromagnet Volt: 12
3rd speed 1/min: 1100
TD-travel : 0.00...0.80 "
difference mm: -
Shutoff
electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 350
Shutoff
electromagnet Volt: 12
Del. quantity cm³/: 40.00...60.00
1000S.: (40.00...60.00)

2nd speed 1/min: 450
Shutoff
electromagnet Volt: 12
Del. quantity cm³/: 10.00...40.00
1000S.: (10.00...40.00)

4th speed 1/min: 100
Shutoff
electromagnet Volt: 12
Del. quantity cm³/: 40.00...80.00
1000S.: (40.00...80.00)

Shutoff electromagnet:

Cut-in
min voltage : 10.0
Rated voltage : 12.0

Mounting and assembly dimensions:

Designation
K mm: -
KF mm: K-0T
MS mm: 0,0...1,2
SVS max. mm: 3,5
HBA stroke mm: 7,2

Remarks:

:
:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 03.11.92
 Replaces : 07.07.92
 Test oil : ISO-4113
 Combination no. : 0 400 074 942
 Injection pump
 Pump designation : PES4M55C320RS154
 EP type number : 0 410 054 971
 Governor
 Governor design. : RSF360/2300M63
 0 420 021 037
 Governor no. : 0 420 021 037
 Cust. part no. : T4
 Customer-spec. information
 Customer : MB

Engine : OM601 (2,0 L)

1st version kW : 53.0

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10
 : (1,95...2,15)
 Rack travel in mm : 20.00...22.00
 Firing order : 1-3-4-2

Phasing : 0-90-180-270
 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.10...11.20

Del.quantity cm³/ : 3.1...3.2

100 s : (3.0...3.3)

Spread cm³ : 0.2

100 s : (0.3)

2nd speed rpm : 375

Rack travel in mm : 5,4...5.6

Del.quantity cm³/ : 0.5...0.6

100 s : (0.4...0.9)

Spread cm³ : 0.1

100 s : (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 31.0...32.0

1000 : (30.0...33.0)

Spread cm³ : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 7.80...8.20

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER
 POSITION

Speed rpm : 1000

Rack travel in mm : 0.90...1.00

LOW IDLE 1

Control lever

position degrees: 13...17
Setting point w/out bumper spring
Speed rpm : 375
Rack travel in mm : 5.5

Testing:

Speed rpm : 225
Minimum rack travel: 9,0
Speed rpm : 375
Rack travel in mm : 5.40...5.60
Rack travel in mm : 1.50
Speed rpm : 590...690
Speed rpm : 1000
Maximum rack travel: 1.00

SET IDLE AUXILIARY SPRING

Speed rpm : 400
Rack travel in mm : 4.20...4.40
 : (4.10...4.50)

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1000
Rack travel in m: 11.10...11.20
2nd speed rpm : 1800
Rack travel in m: 10.80...11.00
3rd speed rpm : 2200
Rack travel in m: 10.30...10.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1800
Del. quantity cm³/ : 34.0...35.5
 1000 s: (33.0...36.5)
Spread cm³ : 2.50
 1000 s: (3.00)
Speed rpm : 2200
Del. quantity cm³/ : 33.0...35.0
 1000 s: (32.0...36.0)
Spread cm³ : 2.50
 1000 s: (3.00)

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 55.0...0.0
 1000 s: (55.0...0.0)
Rack travel in mm : 20.10...0.00

HIGH IDLE

1st version
Speed rpm : 2500
Rack travel in mm : 7.80...8.20
Del. quantity cm³/ : 22.0...26.0
 1000 s: (21.0...27.0)

Spread cm³ : 2.50
 1000 s: (3.00)

LOW IDLE

Speed rpm : 375
Rack travel in mm : 5.40...5.60
Del. quantity cm³/ : 5.0...6.0
 1000 s: (4.5...9.0)
Spread cm³ : 1.00
 1000 s: (1.50)

SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop

Speed rpm : 360
Rack travel in mm : (12,0...13,4)
Del. quantity cm³/ : -
 1000 s: (30,0...38,0)
Current A : 1,8

Control lever at full-load stop

Speed rpm : 2950
Rack travel in mm : 0,0...1,0
Current short-duration A : 3,0
Starting test
Speed rpm : 100
Del. quantity cm³/ : -
min. 1000 s: 55,0 / 1,8A

Remarks:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.
With n = 335 1/min. and pu = 450 mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7°

(19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1.
Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400

Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2,043...2,103 (2,013...2,132) V must be displayed on the digital voltmeter.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 03.11.92
 Replaces : 07.07.92
 Test oil : ISO-4113

Combination no. : 0 400 074 948

Injection pump
 Pump designation : PES4M55C32ORS154
 EP type number : 0 410 054 971
 Governor
 Governor design. : RSF375/2300M61
 Governor no. : 0 420 021 033

Cust. part no. : T4

Customer-spec. information
 Customer : MB

Engine : OM601 (2,0 L)

1st version kW : 53.0

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10
 : (1,95...2,15)

Rack travel in mm : 20.00...22.00
 Firing order : 1-3-4-2

Phasing : 0-90-180-270
 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.10...11.20

Del. quantity cm³/ : 3.1...3.2

100 s : (3.0...3.3)

Spread cm³ : 0.2

100 s : (0.3)

2nd speed rpm : 375

Rack travel in mm : 5,4...5.6

Del. quantity cm³/ : 0.5...0.6

100 s : (0.4...0.9)

Spread cm³ : 0.1

100 s : (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del. quantity : 31.0...32.0

1000 : (30.0...33.0)

Spread cm³ : 2.50

1000 : (3.00)

RATED SPEED

1st version

Control lever
 position degrees: 50...0

3rd rack travel in: 7.80...8.20

Speed rpm : 2500

4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER

POSITION

Speed rpm : 1000

Rack travel in mm : 0.90...1.00

LOW IDLE 1

Control lever
 position degrees: 13...17

Setting point w/out bumper spring

1000 1/min; a voltage of 2,043...2,103
(2,013...2,132) V must be displayed
on the digital voltmeter.



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 646 792
 Injection pump
 Pump designation : PE6P120A320LS7854
 EP type number : 0 412 626 872
 Governor
 Governor design. : RQV350...1050PA1051
 Governor no. : 0 421 814 036

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.00...14.10

Del.quantity cm³/ : 23.4...23.6

100 s: (23.1...23.9)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.5...6.1

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.6

100 s: (1.0)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350
 travel mm : 1.00...1.50

2nd speed rpm : 453
 travel mm : 2.30...2.80

3rd speed rpm : 770
 travel mm : 4.70...5.20

4th speed rpm : 1108
 travel mm : 9.40...9.90

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1

Speed rpm : 1160

Rack travel in mm : 12.70...15.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 600

Aneroid pressure h: 1000
Del.quantity : 234.0...236.0
1000 : (231.0...239.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 99...107

Testing:
1st rack travel in: 12.90
Speed rpm : 1090...1105
2nd rack travel in: 4.00
Speed rpm : 1155...1185
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 65...73

Testing:
Speed rpm : 250
Minimum rack travel: 9.50
Speed rpm : 350
Rack travel in mm : 5.70...5.90
Rack travel in mm : 2.00
Speed rpm : 455...495

CONSTANT REGULATION

Speed rpm : 380...550

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.00...10.30

Measurement
Speed 1/min : 500

1st pressure hPa : 275
Rack travel in m: 10.80...10.90
2nd pressure hPa : 580
Rack travel in m: 12.40...12.60

START CUT-OUT

Speed 1/min : 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000
Speed rpm : 1050
Del.quantity cm³/ : 223.0...227.0
1000 s: (220.0...230.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: 1000
Speed rpm : 1050
Del.quantity cm³/ : 167.0...171.0 *
1000 s: (164.0...174.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 130.0...132.0
1000 s: (127.0...135.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.90
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 240.0...260.0
1000 s: (236.0...264.0)

Remarks:

* = Set at reduced-delivery stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : 10.92
 Test oil : ISO-4113
 Combination no. : 0 402 646 794
 Injection pump
 Pump designation : PE6P120A320LS7858
 EP type number : 0 412 626 875
 Governor
 Governor design. : RQV300...1050PA1033
 -9
 Governor no. : 0 421 814 028

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kw : 200.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve
 : 1 417 413 025
 Inlet press., bar : 1.50
 Overflow
 quantity min. 1/h: 100...120
 Test nozzle holder
 assembly : 1 688 901 105
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,8
 Test lines : 1 680 750 075
 Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 5.50...5.60
 : (5.45...5.65)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 3- 5- 2- 4- 1
 Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1050
 Rack travel in mm : 11.70...11.80
 Del. quantity cm³/ : 18.9...19.1
 100 s: (18.6...19.4)
 Spread cm³ : 0.5
 100 s: (0.9)
 2nd speed rpm : 300.0
 Rack travel in mm : 4.9...5.5
 Del. quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)
 Spread cm³ : 0.6
 100 s: (1.0)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
 travel mm : 0.50...1.00
 2nd speed rpm : 575
 travel mm : 4.30...4.80
 3rd speed rpm : 625
 travel mm : 4.80...5.30
 4th speed rpm : 830
 travel mm : 5.90...6.40
 5th speed rpm : 1109
 travel mm : 8.20...8.70

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1160
 Rack travel in mm : 9.40...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1050
Aneroid pressure h: 800
Del. quantity : 189.0...191.0
1000 : (186.0...194.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 115...123

Testing:
1st rack travel in: 10.70
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1145...1175
4th rack travel in: 1300
Speed rpm : 0.00...1.50

LOW IDLE 1
Control lever
position degrees: 77...85

Testing:
Speed rpm : 200
Minimum rack travel: 8.10
Speed rpm : 300
Rack travel in mm : 5.10...5.30
Rack travel in mm : 2.00
Speed rpm : 380...420

CONSTANT REGULATION
Speed rpm : 300...400

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.60...9.90

Measurement
Speed 1/min : 500

1st pressure hPa : 200
Rack travel in m: 10.00...10.10
2nd pressure hPa : 350
Rack travel in m: 10.70...10.90

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 800
Speed rpm : 550
Del. quantity cm³/ : 182.0...186.0
1000 s: (179.0...189.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del. quantity cm³/ : 126.0...128.0
1000 s: (123.0...131.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.70
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 210.0...230.0
1000 s: (206.0...234.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : 10.92
 Test oil : ISO-4113

Combination no. : 0 402 646 795

Injection pump
 Pump designation : PE6P120A320LS7858
 EP type number : 0 412 626 875
 Governor
 Governor design. : RQV300...1050PA1033
 -8
 Governor no. : 0 421 814 027

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kw : 180.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60
 : (5.45...5.65)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.10...11.20

Del. quantity cm³/ : 17.0...17.2

100 s: (16.7...17.5)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.9...5.5

Del. quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.6

100 s: (1.0)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
 travel mm : 0.50...1.00

2nd speed rpm : 575
 travel mm : 4.30...4.80

3rd speed rpm : 625
 travel mm : 4.80...5.30

4th speed rpm : 830
 travel mm : 5.90...6.40

5th speed rpm : 1109
 travel mm : 8.20...8.70

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1170

Rack travel in mm : 8.80...11.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1050
Aneroid pressure h: 700
Del. quantity : 170.0...172.0
1000 : (167.0...175.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 117...125

Testing:
1st rack travel in: 10.10
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1145...1175
4th rack travel in: 1300
Speed rpm : 0.00...1.50

LOW IDLE 1
Control lever
position degrees: 79...87

Testing:
Speed rpm : 200
Minimum rack travel: 8.10
Speed rpm : 300
Rack travel in mm : 5.10...5.30
Rack travel in mm : 2.00
Speed rpm : 380...420

CONSTANT REGULATION
Speed rpm : 300...400

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.90...10.20

Measurement
Speed 1/min : 500

1st pressure hPa : 200
Rack travel in m: 10.10...10.20 *
2nd pressure hPa : 300
Rack travel in m: 10.60...10.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 700
Speed rpm : 550
Del. quantity cm³/ : 160.0...164.0
1000 s: (157.0...167.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del. quantity cm³/ : 130.0...132.0
1000 s: (127.0...135.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.10
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 125.0...145.0
1000 s: (121.0...149.0)

Remarks:

* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : 09.92
 Test oil : 150-4113
 Combination no. : 0 402 646 797
 Injection pump
 Pump designation : PE6P120A320LS7858
 EP type number : 0 412 626 875
 Governor
 Governor design. : RQ300/1050PA1030-4
 Governor no. : 0 421 801 664

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 180.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60
 : (5.45...5.65)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1050
 Rack travel in mm : 11.10...11.20
 Del. quantity cm³/ : 17.0...17.2
 100 s: (16.7...17.5)
 Spread cm³ : 0.5
 100 s: (0.9)

2nd speed rpm : 300.0
 Rack travel in mm : 4.9...5.5
 Del. quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)
 Spread cm² : 0.6
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -2
 Speed rpm : 600
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1050
 Aneroid pressure h: 700
 Del. quantity : 170.0...172.0
 1000 : (167.0...175.0)
 Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
 Setting point:
 Speed rpm : 600
 Rack travel in mm : 20.0

Testing:
1st rack travel in: 10.10
Speed rpm : 1090...1105
2nd rack travel in: 4.00
Speed rpm : 1160...1190
4th rack travel in: 1300
Speed rpm : 0.00...1.50

LOW IDLE 1
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.2

Testing:
Speed rpm : 200
Minimum rack travel: 7.60
Speed rpm : 300
Rack travel in mm : 5.10...5.30
Rack travel in mm : 2.00
Speed rpm : 360...400

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.90...10.20

Measurement
Speed 1/min : 500

1st pressure hPa : 200
Rack travel in m: 10.10...10.20 *
2nd pressure hPa : 300
Rack travel in m: 10.60...10.80

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 700
Speed rpm : 550
Del.quantity cm³/ : 160.0...164.0
1000 s: (157.0...167.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 130.0...132.0
1000 s: (127.0...135.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.10
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 40.0...70.0
1000 s: (36.0...74.0)
Rack travel in mm : 9.90...10.30

Remarks:

* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 9,0 m
 Edition : 03.12.92
 Replaces : 02.90
 Test oil : ISO-4113

Combination no. : 0 402 646 853

Injection pump
 Pump designation : PE6P120A320RS7138
 EP type number : 0 412 626 822
 Governor
 Governor design. : RQ200/1100PA873
 Governor no. : 0 421 801 415

Customer-spec. information
 Customer : SAAB-SCANIA

Engine : DS9 05

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 588 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50
 : (4.35...4.55)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.20...12.30

Del.quantity cm³/ : 16.5...16.7

100 s: (16.2...17.0)

Spread cm³ : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 5.1...5.7

Del.quantity cm³/ : 2.1...2.5

100 s: (-)

Spread cm³ : 0.3

100 s: (0.6)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 165.0...167.0

1000 : (162.0...170.0)

Spread cm³ : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 16.5

Testing:

1st rack travel in: 11.20

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1300...1330

4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 225
Rack travel in mm : 5.0

Testing:

Speed rpm : 100
Minimum rack travel: 6.40
Speed rpm : 225
Rack travel in mm : 4.90...5.10
Rack travel in mm : 2.00
Speed rpm : 320...360

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 12.20...12.30

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.60...11.00
2nd pressure hPa : 360
Rack travel in m: 11.80...11.90
3rd pressure hPa : 240
Rack travel in m: 11.00...11.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 1100
Del. quantity cm³/ : 163.0...171.0
1000 s: (161.0...173.0)
Aneroid pressure h: -
Speed rpm : 500
Del. quantity cm³/ : 125.0...129.0
1000 s: (123.0...131.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.20
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 270.0...320.0
1000 s: (-)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 225
Rack travel in mm : 4.90...5.10

Remarks:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring
preload on new delivery-valve holders
to 2.9...3.1 mm.

ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO
diaphragm.

APPLICATION

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 11,1 o
 Edition : 03.12.92
 Replaces : 02.90
 Test oil : ISO-4113
 Combination no. : 0 402 646 875
 Injection pump
 Pump designation : PE6P120A720RS7126Z
 EP type number : 0 412 626 830
 Governor
 Governor design. : RQ200/1000PA745-1
 Governor no. : 0 421 801 472

Customer-spec. information
 Customer : SCANIA

Engine : DSC 11 08

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 1 688 901 019
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,8
 Test lines : 1 680 750 015
 Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10
 : (4.95...5.15)
 Rack travel in mm : 9.00...12.00

DO2

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700
 Rack travel in mm : 12.80...12.90
 Del. quantity cm³/ : 20.4...20.6
 100 s: (20.1...20.9)
 Spread cm³ : 0.6
 100 s: (0.9)
 2nd speed rpm : 225.0
 Rack travel in mm : 4.7...5.1
 Del. quantity cm³/ : 1.8...2.2
 100 s: (-)
 Spread cm³ : 0.3
 100 s: (0.6)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 600
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700
 Aneroid pressure h: 900
 Del. quantity : 204.0...206.0
 1000 : (201.0...209.0)
 Spread cm³ : 6.00
 1000 : (9.00)

RATED SPEED

1st version
 Setting point:
 Speed rpm : 600
 Rack travel in mm : 16.5

Testing:
 1st rack travel in: 11.80
 Speed rpm : 1045...1060
 2nd rack travel in: 4.00
 Speed rpm : 1180...1210

4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 225
Rack travel in mm : 4.8

Testing:

Speed rpm : 100
Minimum rack travel: 6.30
Speed rpm : 225
Rack travel in mm : 4.70...4.90
Rack travel in mm : 2.00
Speed rpm : 310...350

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 12.80...12.90

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.30...10.70
2nd pressure hPa : 470
Rack travel in m: 12.30...12.40
3rd pressure hPa : 320
Rack travel in m: 11.30...11.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 1000
Del.quantity cm³/ : 197.0...205.0
1000 s: (195.0...207.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 142.0...146.0
1000 s: (140.0...148.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.80
Speed rpm : 1045...1060

STARTING FUEL DELIVERY

D03

Speed rpm : 100
Del.quantity cm³/ : 130.0...170.0
1000 s: (-)
Rack travel in mm : 10.30...10.70

LOW IDLE

Speed rpm : 225
Rack travel in mm : 4.70...4.90

Remarks:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring
preload on new delivery-valve holders
to 2.9...3.1 mm.

ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO
diaphragm.

For comb. with letter index see
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania
on November 14, 1989

Start of delivery - engine: 9° before
TDC

Firing sequence of engine:
1-5-3-6-2-4.

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 11,1 r
 Edition : 03.12.92
 Replaces : 04.92
 Test oil : ISO-4113
 Combination no. : 0 402 646 887
 Injection pump
 Pump designation : PE6P120A72ORS7188
 EP type number : 0 412 626 832
 Governor
 Governor design. : RQV200...950PA725-7
 Governor no. : 0 421 813 803

Customer spec. information
 Customer : SCANIA

Engine : DSC 11 23

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 1 688 901 104
 Opening
 pressure, bar : 250...253
 Orifice plate
 diameter mm : 0,7
 Test lines : 1 680 750 008
 Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 4.40...4.50
 : (4.35...4.55)
 Rack travel in mm : 9.00...12.00

D04

Firing order : 1-5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700
 Rack travel in mm : 13.80...13.90
 Del.quantity cm³/ : 25.1...25.3
 100 s : (24.8...25.6)
 Spread cm³ : 0.8
 100 s : (1.2)

2nd speed rpm : 250.0
 Rack travel in mm : 4.6...5.0
 Del.quantity cm³/ : 1.4...2.0
 100 s : (-)
 Spread cm³ : 0.4
 100 s : (0.8)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225
 travel mm : 1.20...1.60
 2nd speed rpm : 350
 travel mm : 2.40...3.00
 3rd speed rpm : 650
 travel mm : 4.50...5.10
 4th speed rpm : 1045
 travel mm : 8.40...8.60
 5th speed rpm : 1125
 travel mm : 9.30...9.70

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1150
 Rack travel in mm : 7.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700
 Aneroid pressure h: 1500
 Del.quantity : 251.0...253.0
 1000 : (248.0...256.0)

Spread cm3 : 8.00
1000 : (12.00)

RATED SPEED

1st version
Control lever
position degrees: 110...118

Testing:
1st rack travel in: 12.80
Speed rpm : 990...1000
2nd rack travel in: 4.00
Speed rpm : 1110...1140
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 60...68

Testing:
Speed rpm : 125
Minimum rack travel: 6.20
Speed rpm : 250
Rack travel in mm : 4.60...4.80
Rack travel in mm : 2.00
Speed rpm : 370...430

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 1500
Rack travel mm : 13.80...13.90

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.20...10.60
2nd pressure hPa : 440
Rack travel in m: 12.00...12.10
3rd pressure hPa : 270
Rack travel in m: 10.90...11.10

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1500
Speed rpm : 950
Del.quantity cm3/ : 228.0...236.0
1000 s: (226.0...238.0)
Aneroid pressure h: -
Speed rpm : 500

Del.quantity cm3/ : 152.0...154.0
1000 s: (149.0...157.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 12.80
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 150.0...180.0
1000 s: (-)
Rack travel in mm : 10.20...10.60

LOW IDLE

Speed rpm : 250
Rack travel in mm : 4.60...4.80

Remarks:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring
preload on new delivery-valve holders
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO
diaphragm.

APPLICATION

Navy

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 9,0 l 4
 Edition : 30.10.92
 Replaces : 12.91
 Test oil : ISO-4113
 Combination no. : 0 402 646 909
 Injection pump
 Pump designation : PE6P120A32ORS713SZ
 EP type number : 0 412 626 856
 Governor
 Governor design. : RGV200...1100PA712-5
 Governor no. : 0 421 813 951

Customer-spec. information
 Customer : SCANIA

Engine : DS9 07

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 1 688 901 104
 Opening
 pressure, bar : 250...253
 Orifice plate
 diameter mm : 0,7
 Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 4.40...4.50
 : (4.35...4.55)
 Rack travel in mm : 9.00...12.00

DO6

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700
 Rack travel in mm : 11.80...11.90
 Del.quantity cm³/ : 15.0...15.2
 100 s: (14.7...15.5)
 Spread cm³ : 0.8
 100 s: (1.2)

2nd speed rpm : 250.0
 Rack travel in mm : 4.5...4.9
 Del.quantity cm³/ : 1.2...1.6
 100 s: (-)
 Spread cm³ : 0.4
 100 s: (0.8)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225
 travel mm : 0.90...1.30
 2nd speed rpm : 350
 travel mm : 2.50...3.10
 3rd speed rpm : 650
 travel mm : 5.40...6.00
 4th speed rpm : 1145
 travel mm : 8.90...9.10
 5th speed rpm : 1280
 travel mm : 10.10...10.50

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1130
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700
 Aneroid pressure h: 900
 Del.quantity : 150.0...152.0
 1000 : (147.0...155.0)

Spread cm³ : 8.00
1000 : (12.00)

RATED SPEED

1st version
Control lever
position degrees: 114...122

Testing:
1st rack travel in: 10.80
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1270...1300
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 61...69

Testing:
Speed rpm : 100
Minimum rack travel: 6.10
Speed rpm : 250
Rack travel in mm : 4.50...4.70
Rack travel in mm : 2.00
Speed rpm : 310...370

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 11.80...11.90

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.90...10.30
2nd pressure hPa : 350
Rack travel in m: 11.50...11.60
3rd pressure hPa : 220
Rack travel in m: 10.70...10.90

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 1100
Del. quantity cm³/ : 145.0...153.0
1000 s: (143.0...155.0)
Aneroid pressure h: -
Speed rpm : 500

Del. quantity cm³/ : 114.0...118.0
1000 s: (112.0...120.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.80
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 115.0...145.0
1000 s: (-)
Rack travel in mm : 9.90...10.30

LOW IDLE

Speed rpm : 250
Rack travel in mm : 4.50...4.70

Remarks:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring
preload on new delivery-valve holders
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO
diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA
 Edition : 03.12.92
 Replaces : 09.92
 Test oil : ISO-4113
 Combination no. : 0 402 646 910
 Injection pump
 Pump designation : PE6P120A320RS7138
 EP type number : 0 412 626 822
 Governor
 Governor design. : RQV200...1100PA712-5
 Governor no. : 0 421 813 951

Customer-spec. information
 Customer : SCANIA

Engine : DS9 08

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 1 688 901 104
 Opening
 pressure, bar : 250...253
 Orifice plate
 diameter mm : 0,7
 Test Lines : 1 680 750 008
 Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600
 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 4.40...4.50
 : (4.35...4.55)
 Rack travel in mm : 9.00...12.00

008

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700
 Rack travel in mm : 13.00...13.10
 Del.quantity cm³/ : 18.0...18.2
 100 s: (17.7...18.5)
 Spread cm³ : 0.8
 100 s: (1.2)
 2nd speed rpm : 250.0
 Rack travel in mm : 4.9...5.1
 Del.quantity cm³/ : 1.2...1.6
 100 s: (-)
 Spread cm³ : 0.4
 100 s: (0.8)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225
 travel mm : 0.90...1.30
 2nd speed rpm : 350
 travel mm : 2.50...3.10
 3rd speed rpm : 650
 travel mm : 5.40...6.00
 4th speed rpm : 1145
 travel mm : 8.90...9.10
 5th speed rpm : 1280
 travel mm : 10.10...10.50

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1130
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700
 Aneroid pressure h: 900
 Del.quantity : 180.0...182.0
 1000 : (177.0...185.0)

Spread cm³ : 8.00
1000 : (12.00)

RATED SPEED

1st version
Control lever
position degrees: 114...122

Testing:
1st rack travel in: 12.00
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1275...1305
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 61...69

Testing:
Speed rpm : 100
Minimum rack travel: 6.50
Speed rpm : 250
Rack travel in mm : 4.90...5.10
Rack travel in mm : 2.00
Speed rpm : 300...360

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 13.00...13.10

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.90...10.30
2nd pressure hPa : 480
Rack travel in m: 12.30...12.40
3rd pressure hPa : 220
Rack travel in m: 10.70...10.90

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 1100
Del.quantity cm³/ : 163.0...171.0
1000 s: (161.0...173.0)
Aneroid pressure h: -
Speed rpm : 500

Del.quantity cm³/ : 114.0...118.0
1000 s: (112.0...120.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 12.00
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 120.0...140.0
1000 s: (-)
Rack travel in mm : 9.90...10.30

LOW IDLE

Speed rpm : 250
Rack travel in mm : 4.90...5.10

Remarks:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring
preload on new delivery-valve holders
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO
diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 402 646 921X

Injection pump
 Pump designation : PE6P120A320LS7837-10
 EP type number : 0 412 626 855
 Governor
 Governor design. : RQ300/1050PA972-3
 Governor no. : 0 421 801 565

Cust. part no. : 0200741202

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 15.00...15.10

Del. quantity cm³/ : 24.4...24.6

100 s: (24.1...24.9)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...6.2

Del. quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1200

Del. quantity : 244.0...246.0

1000 : (241.0...249.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600
Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.80
Speed rpm : 1090...1105
2nd rack travel in: 4.00
Speed rpm : 1185...1215
4th rack travel in: 1300
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.9

Testing:

Speed rpm : 200
Minimum rack travel: 7.70
Speed rpm : 300
Rack travel in mm : 5.80...6.00
Rack travel in mm : 2.00
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 600
Rack travel in m: 15.00...15.10
2nd speed rpm : 1050
Rack travel in m: 14.80...15.00

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : -
Rack travel mm : 8.90...9.20

Measurement

Speed 1/min : 500

1st pressure hPa : 150
Rack travel in m: 9.50...9.60
2nd pressure hPa : 550
Rack travel in m: 13.20...13.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 1050

Del.quantity cm³/ : 234.0...238.0
1000 s: (231.0...241.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 132.0...134.0
1000 s: (129.0...137.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.80
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 60.0...93.0
1000 s: (56.0...94.0)
Rack travel in mm : 8.90...9.30

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 646 924X
 Injection pump
 Pump designation : PE6P120A320LS7837-10
 EP type number : 0 412 626 855
 Governor
 Governor design. : RQ300/950PA971-3
 Governor no. : 0 421 801 557

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kw : 250.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 15.00...15.10

Del.quantity cm³/ : 24.4...24.6

100 s: (24.1...24.9)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...6.2

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1200

Del.quantity : 244.0...246.0

1000 : (241.0...249.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 14.00
Speed rpm : 990...1005
2nd rack travel in: 4.00
Speed rpm : 1080...1110
4th rack travel in: 1200
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.9

Testing:

Speed rpm : 200
Minimum rack travel: 8.20
Speed rpm : 300
Rack travel in mm : 5.80...6.00
Rack travel in mm : 2.00
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 600
Rack travel in m: 15.00...15.10
2nd speed rpm : 950
Rack travel in m: 15.00...15.10

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 8.90...9.20

Measurement

Speed 1/min : 500
1st pressure hPa : 150
Rack travel in m: 9.50...9.60
2nd pressure hPa : 550
Rack travel in m: 13.20...13.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 132.0...134.0
1000 s: (129.0...137.0)
Spread cm3 : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 14.00
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 65.0...95.0
1000 s: (61.0...99.0)
Rack travel in mm : 8.90...9.30

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 646 925X
 Injection pump
 Pump designation : PE6P120A320LS7837-10
 EP type number : 0 412 626 855
 Governor
 Governor design. : RQV300...950PA797-20
 Governor no. : 0 421 813 893

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kw : 250.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve
 : 1 417 413 025
 Inlet press., bar : 1.50
 Overflow
 quantity min. 1/h: 100...120
 Test nozzle holder
 assembly : 1 688 901 105
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,8
 Test lines : 1 680 750 075
 Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 3- 5- 2- 4- 1
 Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600
 Rack travel in mm : 15.00...15.10
 Del.quantity cm³/ : 24.4...24.6
 100 s: (24.1...24.9)
 Spread cm³ : 0.5
 100 s: (0.9)
 2nd speed rpm : 300.0
 Rack travel in mm : 5.6...6.2
 Del.quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)
 Spread cm³ : 0.6
 100 s: (1.0)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
 travel mm : 1.00...1.50
 2nd speed rpm : 567
 travel mm : 4.40...4.90
 3rd speed rpm : 780
 travel mm : 6.10...6.60
 4th speed rpm : 1009
 travel mm : 8.30...8.80
 5th speed rpm : 1190
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1025
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 600
Aneroid pressure h: 1200
Del. quantity : 244.0...246.0
1000 : (241.0...249.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 120...128

Testing:

1st rack travel in: 14.00
Speed rpm : 990...1000
2nd rack travel in: 4.00
Speed rpm : 1085...1115
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 82...90

Testing:

Speed rpm : 200
Minimum rack travel: 7.70
Speed rpm : 300
Rack travel in mm : 5.60...6.20

CONSTANT REGULATION

Speed rpm : 300...450

TORQUE CONTROL

Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 600
Rack travel in m: 15.00...15.10
2nd speed rpm : 950
Rack travel in m: 15.00...15.10

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 8.90...9.20

Measurement

Speed 1/min : 500

1st pressure hPa : 150
Rack travel in m: 9.50...9.60
2nd pressure hPa : 550
Rack travel in m: 13.20...13.40

START CUT-OUT

Speed 1/min : 240 (260)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -
Speed rpm : 500
Del. quantity cm³/ : 132.0...134.0
1000 s: (129.0...137.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 14.00
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 250.0...270.0
1000 s: (246.0...274.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA
 Edition : 03.12.92
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 402 646 928

Injection pump
 Pump designation : PE6P120A32ORS7138
 EP type number : 0 412 626 822
 Governor
 Governor design. : RQV350...1100PA795
 -12
 Governor no. : 0 421 813 914

Customer-spec. information
 Customer : SCANIA

Engine : DS9 05

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50
 : (4.35...4.55)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.20...12.30

Del. quantity cm³/ : 16.5...16.7

100 s : (16.2...17.0)

Spread cm³ : 0.6

100 s : (0.9)

2nd speed rpm : 350.0
 Rack travel in mm : 4.7...5.3
 Del. quantity cm³/ : 2.0...2.4
 100 s : (-)
 Spread cm³ : 0.3
 100 s : (0.6)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

2nd speed rpm : 350
 travel mm : 1.30...1.70
 3rd speed rpm : 650
 travel mm : 4.10...4.70
 4th speed rpm : 1150
 travel mm : 7.80...8.00
 5th speed rpm : 1260
 travel mm : 8.80...9.20

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1230
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700
 Aneroid pressure h: 900
 Del. quantity : 165.0...167.0
 1000 : (162.0...170.0)
 Spread cm³ : 6.00
 1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 99...107

Testing:

1st rack travel in: 11.20
Speed rpm : 1140...1150
2nd rack travel in: 4.00
Speed rpm : 1240...1270
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 68...76

Testing:

Speed rpm : 100
Minimum rack travel: 10.30
Speed rpm : 350
Rack travel in mm : 4.50...4.70
Rack travel in mm : 2.00
Speed rpm : 370...430

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 12.20...12.30

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.60...11.00
2nd pressure hPa : 360
Rack travel in m: 11.80...11.90
3rd pressure hPa : 250
Rack travel in m: 11.10...11.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 1100
Del.quantity cm³/ : 163.0...171.0
1000 s: (161.0...173.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 125.0...129.0
1000 s: (122.0...132.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.20
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 270.0...320.0
1000 s: (-)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 4.50...4.70

Remarks:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring
preload on new delivery-valve holders
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO
diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 402 646 931X

Injection pump
 Pump designation : PE6P120A320LS7837-10
 EP type number : 0 412 626 855
 Governor
 Governor design. : RQV300...1050PA797
 -24
 Governor no. : 0 421 813 911

Cust. part no. : 0200748302

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 15.00...15.10

Del.quantity cm³/ : 24.4...24.6

100 s: (24.1...24.9)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...6.2

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.6

100 s: (1.0)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
 travel mm : 1.00...1.50

2nd speed rpm : 608
 travel mm : 4.80...5.30

3rd speed rpm : 820
 travel mm : 5.90...6.40

4th speed rpm : 1108
 travel mm : 8.30...8.80

5th speed rpm : 1280
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1

Speed rpm : 1100
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600
Aneroid pressure h: 1200
Del. quantity : 244.0...246.0
1000 : (241.0...249.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version

Control lever
position degrees: 118...126

Testing:

1st rack travel in: 13.80
Speed rpm : 1090...1105
2nd rack travel in: 4.00
Speed rpm : 1165...1195
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 81...89

Testing:

Speed rpm : 200
Minimum rack travel: 7.70
Speed rpm : 300
Rack travel in mm : 5.80...6.00

CONSTANT REGULATION

Speed rpm : 300...550

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 600
Rack travel in m: 15.00...15.10
2nd speed rpm : 1050
Rack travel in m: 14.80...15.00

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 8.90...9.20

Measurement

Speed 1/min : 500

1st pressure hPa : 150
Rack travel in m: 9.50...9.60
2nd pressure hPa : 550
Rack travel in m: 13.20...13.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 1050
Del. quantity cm³/ : 234.0...238.0
1000 s: (231.0...241.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del. quantity cm³/ : 132.0...134.0
1000 s: (129.0...137.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 13.80
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 220.0...240.0
1000 s: (216.0...244.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,7 n
 Edition : 27.11.92
 Replaces : 08.92
 Test oil : ISO-4113

Combination no. : 0 402 646 936

Injection pump
 Pump designation : PE6P120A32ORS7230
 EP type number : 0 412 626 843
 Governor
 Governor design. : RQV250...1000PA990K
 Governor no. : 0 421 815 274

Customer-spec. information
 Customer : DAF

Engine : WS 315 G

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder assembly : 1 688 901 105

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter x Wall thickness x Length mm : 8.00X2.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10
 : (4.95...5.15)
 Rack travel in mm : 14.00...15.00

D20

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 980

Rack travel in mm : 14.20...14.30

Del. quantity cm³/ : 26.4...26.6

100 s: (26.1...26.9)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 250.0
 Rack travel in mm : 5.8...6.0
 Del. quantity cm³/ : 1.4...2.0
 100 s: (1.1...2.3)

Spread cm³ : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
 travel mm : 1.30...1.70

2nd speed rpm : 285
 travel mm : 2.10...2.50

3rd speed rpm : 685
 travel mm : 6.20...6.60

4th speed rpm : 1030
 travel mm : 9.60...10.00

5th speed rpm : 1145
 travel mm : 11.20...11.40

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1

Speed rpm : 1130
 Rack travel in mm : 12.90...15.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 980
 Aneroid pressure h: 1500
 Del. quantity : 264.0...266.0
 1000 : (261.0...269.0)

Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 115...123

Testing:
1st rack travel in: 13.20
Speed rpm : 1030...1040
2nd rack travel in: 4.00
Speed rpm : 1140...1170
4th rack travel in: 1275
Speed rpm : 0.00...1.40

LOW IDLE 1
Control lever
position degrees: ?

Testing:
Speed rpm : 150
Minimum rack travel: 6.70
Speed rpm : 250
Rack travel in mm : 5.10...5.30
Rack travel in mm : 2.00
Speed rpm : 310...350

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 500
Rack travel in m: 13.00...13.10
2nd speed rpm : 600
Rack travel in m: 13.00...13.20
3rd speed rpm : 750
Rack travel in m: 13.40...13.60
4th speed rpm : 825
Rack travel in m: 13.80...14.00
5th speed rpm : 980
Rack travel in m: 14.60...14.80

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 980
Pressure hPa : 1500
Rack travel mm : 14.20...14.30

Measurement
Speed 1/min : 980

1st pressure hPa : -
Rack travel in m: 8.80...9.00
2nd pressure hPa : 630
Rack travel in m: 12.80...12.90

3rd pressure hPa : 340
Rack travel in m: 10.70...10.90

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1500
Speed rpm : 500
Del. quantity cm³/ : 288.0...292.0
1000 s: (285.0...295.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 600
Del. quantity cm³/ : 162.0...164.0
1000 s: (159.0...167.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.20
Speed rpm : 1030...1040

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.10...5.30

Remarks:

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA
 Edition : 30.10.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 646 937
 Injection pump
 Pump designation : PE6P120A72ORS71880
 EP type number : 0 412 626 346
 Governor
 Governor design. : RQV200...950PA725-7
 Governor no. : 0 421 813 803

Customer-spec. information
 Customer : SCANIA

Engine : D5C11 21

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 1 688 901 104
 Opening
 pressure, bar : 250...253
 Orifice plate
 diameter mm : 0,7
 Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 4.40...4.50
 : (4.35...4.55)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4
 Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700
 Rack travel in mm : 12.70...12.80
 Del.quantity cm³/ : 21.9...22.1
 100 s : (21.6...22.4)
 Spread cm³ : 0.8
 100 s : (1.2)
 2nd speed rpm : 225.0
 Rack travel in mm : 4.6...5.2
 Del.quantity cm³/ : 1.5...1.9
 100 s : (-)
 Spread cm³ : 0.4
 100 s : (0.8)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225
 travel mm : 1.20...1.60
 2nd speed rpm : 350
 travel mm : 2.40...3.00
 3rd speed rpm : 650
 travel mm : 4.50...5.10
 4th speed rpm : 1045
 travel mm : 8.40...8.60
 5th speed rpm : 1125
 travel mm : 9.30...9.70

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1150
 Rack travel in mm : 7.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700
 Aneroid pressure h: 1500
 Del.quantity : 219.0...221.0
 1000 : (216.0...224.0)

Spread cm3 : 8.00
1000 : (12.00)

RATED SPEED

1st version
Control lever
position degrees: 108...116

Testing:
1st rack travel in: 11.70
Speed rpm : 990...1000
2nd rack travel in: 4.00
Speed rpm : 1105...1135
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 58...66

Testing:
Speed rpm : 100
Minimum rack travel: 6.20
Speed rpm : 225
Rack travel in mm : 4.60...4.80
Rack travel in mm : 2.00
Speed rpm : 350...410

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 1500
Rack travel mm : 12.70...12.80

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.30...10.70
2nd pressure hPa : 440
Rack travel in m: 12.00...12.10
3rd pressure hPa : 270
Rack travel in m: 10.90...11.10

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1500
Speed rpm : 950
Del.quantity cm3/ : 202.0...210.0
1000 s: (200.0...212.0)
Aneroid pressure h: -
Speed rpm : 500

Del.quantity cm3/ : 151.0...155.0
1000 s: (149.0...157.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.70
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 150.0...180.0
1000 s: (-)
Rack travel in mm : 10.30...10.70

LOW IDLE

Speed rpm : 225
Rack travel in mm : 4.60...4.80

Remarks:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm.

Because of flattening, set the spring
preload on new delivery-valve holders
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO
diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA
 Edition : 30.10.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 646 938
 Injection pump
 Pump designation : PE6P120A72ORS71880
 EP type number : 0 412 626 846
 Governor
 Governor design. : RQ200/950PA745-3
 Governor no. : 0 421 801 579

Customer-spec. information
 Customer : SCANIA

Engine : DSC 11 21

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 1 688 901 104
 Opening
 pressure, bar : 250...253
 Orifice plate
 diameter mm : 0,7
 Test lines : 1 680 750 008
 Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 4.40...4.50
 : (4.35...4.55)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4
 Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700
 Rack travel in mm : 12.20...12.30
 Del. quantity cm³/ : 21.9...22.1
 100 s: (21.6...22.4)
 Spread cm³ : 0.8
 100 s: (1.2)
 2nd speed rpm : 225.0
 Rack travel in mm : 4.3...4.7
 Del. quantity cm³/ : 1.5...1.9
 100 s: (-)
 Spread cm³ : 0.4
 100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 600
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700
 Aneroid pressure h: 1500
 Del. quantity : 219.0...221.0
 1000 : (216.0...224.0)
 Spread cm³ : 8.00
 1000 : (12.00)

RATED SPEED

1st version
 Setting point:
 Speed rpm : 600
 Rack travel in mm : 16.5
 Testing:
 1st rack travel in: 11.20
 Speed rpm : 995...1010
 2nd rack travel in: 4.00
 Speed rpm : 1110...1140

4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 225
Rack travel in mm : 4.4

Testing:

Speed rpm : 100
Minimum rack travel: 5.90
Speed rpm : 225
Rack travel in mm : 4.30...4.50
Rack travel in mm : 2.00
Speed rpm : 290...350

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 1500
Rack travel mm : 12.20...12.30

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in mm : 9.90...10.30
2nd pressure hPa : 440
Rack travel in mm : 11.50...11.60
3rd pressure hPa : 270
Rack travel in mm : 10.40...10.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500
Speed rpm : 950
Del. quantity cm³/ : 202.0...210.0
1000 s: (200.0...212.0)
Aneroid pressure h: -
Speed rpm : 500
Del. quantity cm³/ : 151.0...155.0
1000 s: (149.0...157.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.20
Speed rpm : 995...1010

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 160.0...200.0
1000 s: (-)
Rack travel in mm : 9.90...10.30

LOW IDLE

Speed rpm : 225
Rack travel in mm : 4.30...4.50

Remarks:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring
preload on new delivery-valve holders
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO
diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 646 942X
 Injection pump
 Pump designation : PE6P120A320LS7837-10
 EP type number : 0 412 626 855
 Governor
 Governor design. : RQ300/1050PA993
 Governor no. : 0 421 801 581
 Cust. part no. : 0200747102
 Customer-spec. information
 Customer : MERCEDES-BENZ
 Engine : OM441 LA
 1st version kW : 250.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve
 : 1 417 413 025
 Inlet press., bar : 1.50
 Overflow
 quantity min. l/h: 100...120
 Test nozzle holder
 assembly : 1 688 901 105
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,8
 Test lines : 1 680 750 075
 Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 3- 5- 2- 4- 1
 Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 6

BASIC SETTINGS

1st speed rpm : 600
 Rack travel in mm : 15.00...15.10
 Del. quantity cm³/ : 24.4...24.6
 100 s: (24.1...24.9)
 Spread cm³ : 0.5
 100 s: (0.9)
 2nd speed rpm : 300.0
 Rack travel in mm : 5.6...6.2
 Del. quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)
 Spread cm³ : 0.6
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 600
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 600
 Aneroid pressure h: 1200
 Del. quantity : 244.0...246.0
 1000 : (241.0...249.0)
 Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600
Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.80
Speed rpm : 1090...1105
2nd rack travel in: 4.00
Speed rpm : 1170...1200
4th rack travel in: 1300
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300
Rack travel in mm : 5.9

Testing:

Speed rpm : 200
Minimum rack travel: 8.10
Speed rpm : 300
Rack travel in mm : 5.80...6.00
Rack travel in mm : 2.00
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version:
1st speed rpm : 600
Rack travel in m: 15.00...15.10
2nd speed rpm : 1050
Rack travel in m: 14.80...15.00
3rd speed rpm : 800

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : -
Rack travel mm : 8.90...9.20

Measurement

Speed 1/min : 500

1st pressure hPa : 150
Rack travel in m: 9.50...9.60
2nd pressure hPa : 550
Rack travel in m: 13.20...13.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

D27

1st version

Aneroid pressure h: 1200
Speed rpm : 1050
Del.quantity cm³/ : 234.0...238.0
1000 s: (231.0...241.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 132.0...134.0
1000 s: (129.0...137.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 13.80
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 220.0...240.0
1000 s: (216.0...244.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PEN 7,2 a
 Edition : 30.10.92
 Replaces : 09.92
 Test oil : ISO-4113
 Combination no. : 0 402 646 948
 Injection pump
 Pump designation : PE6P120A320RS7233-1
 EP type number : 0 412 626 849
 Governor
 Governor design. : RQV300...1300PA1003K
 Governor no. : 0 421 815 281

Customer-spec. information
 Customer : PENTA

Engine : TAMD 72 A

1st version kW : 316.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 457 413 010
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 1 688 901 105
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,8
 Test lines : 1 680 750 015
 Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.30...3.40
 : (3.25...3.45)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1300
 Rack travel in mm : 13.80...13.90
 Del.quantity cm³/ : 24.9...25.1
 100 s: (24.6...25.4)
 Spread cm³ : 0.6
 100 s: (1.0)

2nd speed rpm : 290.0
 Rack travel in mm : 5.8...6.0
 Del.quantity cm³/ : 1.5...2.1
 100 s: (1.3...2.3)
 Spread cm³ : 0.7
 100 s: (1.1)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 275
 travel mm : 1.30...1.50
 2nd speed rpm : 325
 travel mm : 2.00...2.20
 3rd speed rpm : 475
 travel mm : 3.20...3.40
 4th speed rpm : 890
 travel mm : 6.30...6.50
 5th speed rpm : 1350
 travel mm : 9.90...10.10

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1500
 Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1300
 Aneroid pressure h: 2400

Del.quantity : 249.0...251.0
1000 : (246.0...254.0)
Spread cm³ : 6.00
1000 : (10.00)

RATED SPEED

1st version
Control lever
position degrees: 118...126

Testing:

1st rack travel in: 12.80
Speed rpm : 1335...1345
2nd rack travel in: 4.00
Speed rpm : 1460...1490
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 75...79

Testing:

Speed rpm : 100
Minimum rack travel: 7.00
Speed rpm : 290
Rack travel in mm : 5.80...6.00

CONSTANT REGULATION

Speed rpm : 300...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 1300
Rack travel in m: 13.80...13.90
2nd speed rpm : 1200
Rack travel in m: 13.40...13.70
3rd speed rpm : 1000
Rack travel in m: 12.30...12.70
4th speed rpm : 800
Rack travel in m: 11.40...11.60

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 1300
Pressure hPa : 2400
Rack travel mm : 13.80...13.90

Measurement

Speed 1/min : 1300

1st pressure hPa : -
Rack travel in m: 7.20...7.50
2nd pressure hPa : 350

E01

Rack travel in m: 7.40...7.50 *

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 2400
Speed rpm : 800
Del.quantity cm³/ : 233.0...239.0
1000 s: (231.0...241.0)
Spread cm³ : 9.00
1000 s: (13.0)
Aneroid pressure h: 2400
Speed rpm : 1000
Del.quantity cm³/ : 240.0...248.0
1000 s: (238.0...250.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 112.0...114.0
1000 s: (109.0...117.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.80
Speed rpm : 1335...1345

LOW IDLE

Speed rpm : 290
Rack travel in mm : 5.80...6.00
Del.quantity cm³/ : 15.0...21.0
1000 s: (13.0...23.0)
Spread cm³ : 7.00
1000 s: (11.00)

Remarks:

* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 646 950X
 Injection pump
 Pump designation : PE6P120A320LS7837-10
 EP type number : 0 412 626 855
 Governor
 Governor design. : RQ300/950PA993-2
 Governor no. : 0 421 801 590

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 5- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 600

 Rack travel in mm : 15.00...15.10

 Del. quantity cm³/ : 24.4...24.6
 100 s: (24.1...24.9)

 Spread cm³ : 0.5
 100 s: (0.9)

2nd speed rpm : 300.0
 Rack travel in mm : 6.2...6.8
 Del. quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)
 Spread cm³ : 0.6
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -2
 Speed rpm : 600
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 600
 Aneroid pressure h: 1200
 Del. quantity : 244.0...246.0
 1000 : (241.0...249.0)
 Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
 Setting point:
 Speed rpm : 600
 Rack travel in mm : 20.0

Testing:

1st rack travel in: 14.00
Speed rpm : 990...1005
2nd rack travel in: 4.00
Speed rpm : 1065...1095
4th rack travel in: 1200
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.5

Testing:

Speed rpm : 200
Minimum rack travel: 8.30
Speed rpm : 300
Rack travel in mm : 6.20...6.80
Rack travel in mm : 2.00
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 600
Rack travel in m: 15.00...15.10
2nd speed rpm : 950
Rack travel in m: 15.00...15.10

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 8.90...9.20

Measurement

Speed 1/min : 500
1st pressure hPa : 150
Rack travel in m: 9.50...9.60
2nd pressure hPa : 550
Rack travel in m: 13.20...13.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 132.0...134.0
1000 s: (129.0...137.0)

Spread cm3 : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 14.00
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 240.0...260.0
1000 s: (236.0...264.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA
 Edition : 30.10.92
 Replaces : 07.92
 Test oil : ISO-4113
 Combination no. : 0 402 646 951
 Injection pump
 Pump designation : PE6P120A72DRS7188
 EP type number : 0 412 626 832
 Governor
 Governor design. : RQ200/950PA745-3
 Governor no. : 0 421 801 579

Customer-spec. information
 Customer : SCANIA

Engine : D5C 11 77

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 1 688 901 104
 Opening
 pressure, bar : 250...253
 Orifice plate
 diameter mm : 0,7
 Test lines : 1 680 750 008
 Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 4.40...4.50
 : (4.35...4.55)
 Rack travel in mm : 9.00...12.00

EO4

Firing order : 1- 5- 3- 6- 2- 4
 Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700
 Rack travel in mm : 11.10...11.20
 Del.quantity cm³/ : 17.0...17.2
 100 s : (16.8...17.4)
 Spread cm³ : 0.8
 100 s : (1.2)
 2nd speed rpm : 225.0
 Rack travel in mm : 4.5...5.3
 Del.quantity cm³/ : 1.2...1.6
 100 s : (-)
 Spread cm³ : 0.4
 100 s : (0.8)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 600
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700
 Aneroid pressure h: 900
 Del.quantity : 170.0...172.0
 1000 : (168.0...174.0)
 Spread cm³ : 8.00
 1000 : (12.00)

RATED SPEED

1st version
 Setting point:
 Speed rpm : 600
 Rack travel in mm : 16.5
 Testing:
 1st rack travel in: 11.70
 Speed rpm : 995...1010
 2nd rack travel in: 4.00
 Speed rpm : 1110...1140

4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 225
Rack travel in mm : 4.7

Testing:

Speed rpm : 100
Minimum rack travel: 6.20
Speed rpm : 225
Rack travel in mm : 4.60...4.80
Rack travel in mm : 2.00
Speed rpm : 300...360

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 11.10...11.30

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.30...9.70
2nd pressure hPa : 420
Rack travel in m: 10.70...10.80
3rd pressure hPa : 280
Rack travel in m: 9.80...10.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 950
Del.quantity cm³/ : 170.0...172.0
1000 s: (168.0...174.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 120.0...124.0
1000 s: (118.0...126.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.70
Speed rpm : 995...1010

STARTING FUEL DELIVERY

Speed rpm : 100
Rack travel in mm : 9.30...9.70

LOW IDLE

Speed rpm : 225
Rack travel in mm : 4.50...5.10

Remarks:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring
preload on new delivery-valve holders
to 2.9...3.1 mm.

Start-of-delivery setting with RO80
diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF
 Edition : 30.10.92
 Replaces : 06.92
 Test oil : ISO-4113
 Combination no. : 0 402 646 984
 Injection pump
 Pump designation : PE6P120A32ORS7243
 EP type number : 0 412 626 861
 Governor
 Governor design. : RQ275/1150PA987
 Governor no. : 0 421 801 578

Customer-spec. information
 Customer : DAF

Engine : RS 222 L

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 1 688 901 105
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,8
 Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 14.00...15.00

E06

Firing order : 1- 5- 3- 6- 2- 4
 Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10
 & maximum rack tra: 11.7...12.7
 Difference ° CS : 2.25...3.75

BASIC SETTING

1st speed rpm : 1000
 Rack travel in mm : 12.20...12.30
 Del.quantity cm³/ : 18.4...18.6
 100 s: (18.1...18.9)
 Spread cm³ : 0.5
 100 s: (0.9)
 2nd speed rpm : 275.0
 Rack travel in mm : 5.3...5.5
 Del.quantity cm³/ : 1.3...1.9
 100 s: (1.0...2.2)
 Spread cm³ : 0.8
 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 550
 Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1000
 Aneroid pressure h: 1000
 Del.quantity : 184.0...186.0
 1000 : (181.0...189.0)
 Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
 Setting point:
 Speed rpm : 550
 Rack travel in mm : 15.8

Testing:

1st rack travel in: 11.20
Speed rpm : 1200...1215
2nd rack travel in: 4.00
Speed rpm : 1275...1305
4th rack travel in: 1450
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 275
Rack travel in mm : 4.7

Testing:

Speed rpm : 175
Minimum rack travel: 7.50
Speed rpm : 275
Rack travel in mm : 4.60...4.80
Rack travel in mm : 2.00
Speed rpm : 320...360

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 600
Pressure hPa : 1000
Rack travel mm : 12.20...12.30

Measurement

Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 9.30...9.50
2nd pressure hPa : 420
Rack travel in m: 11.60...11.70
3rd pressure hPa : 240
Rack travel in m: 10.30...10.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -
Speed rpm : 600
Del. quantity cm³/ : 120.0...122.0
1000 s: (117.0...125.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 11.20
Speed rpm : 1200...1215

LOW IDLE

Speed rpm : 275
Rack travel in mm : 4.60...4.80

Remarks:

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF
 Edition : 27.11.92
 Replaces : 06.92
 Test oil : ISO-4113

Combination no. : 0 402 646 985

Injection pump
 Pump designation : PE6P120A32ORS7248Z
 EP type number : 0 412 626 862
 Governor
 Governor design. : RQ275/1150PA987
 Governor no. : 0 421 801 578

Customer-spec. information
 Customer : DAF

Engine : RS 200 L

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 14.00...15.00

E08

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10
 & maximum rack tra: 10.8...11.8
 Difference ° CS : 2.25...3.75

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm³/ : 15.4...16.6

100 s: (16.1...16.9)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.3...5.5

Del.quantity cm³/ : 1.3...1.9

100 s: (1.0...2.2)

Spread cm³ : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 164.0...166.0

1000 : (161.0...169.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 15.8

Testing:

1st rack travel in: 10.30
Speed rpm : 1200...1215
2nd rack travel in: 4.00
Speed rpm : 1275...1305
4th rack travel in: 14.50
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 275
Rack travel in mm : 4.7

Testing:

Speed rpm : 175
Minimum rack travel: 7.00
Speed rpm : 275
Rack travel in mm : 4.60...4.80
Rack travel in mm : 2.00
Speed rpm : 320...360

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 600
Pressure hPa : 1000
Rack travel mm : 11.30...11.40

Measurement

Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 9.00...9.20
2nd pressure hPa : 340
Rack travel in m: 10.70...10.80
3rd pressure hPa : 200
Rack travel in m: 9.60...9.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -
Speed rpm : 600
Del. quantity cm³/ : 115.0...117.0
1000 s: (112.0...120.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 10.30
Speed rpm : 1200...1215

LOW IDLE

Speed rpm : 275
Rack travel in mm : 4.60...4.80

Remarks:

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF
Edition : 30.10.92
Replaces : 06.92
Test oil : ISO-4113
Combination no. : 0 402 646 986
Injection pump
Pump designation : PE6P120A32ORS7248Y
EP type number : 0 412 626 863
Governor
Governor design. : RQ275/1150PA987
Governor no. : 0 421 801 578

Customer-spec. information
Customer : DAF

Engine : RS 180 L

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42
Overflow valve : 1 417 413 025
Inlet press., bar : 1.50
Test nozzle holder
assembly : 1 688 901 105
Opening
pressure, bar : 207...210
Orifice plate
diameter mm : 0,8
Test lines : 1 680 750 089
Outside diameter
x Wall thickness
x Length mm : 8.00X2.50X600
(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
Prestroke mm : 5.20...5.30
: (5.15...5.35)
Rack travel in mm : 14.00...15.00

E10

Firing order : 1- 5- 3- 6- 2- 4
Phasing : 0-60-120-180-240-300
Tolerance + - ° : 0.50 (0.75)
Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10
& maximum rack tra: 10.2...11.2
Difference ° CS : 2.25...3.75

BASIC SETTING

1st speed rpm : 1000
Rack travel in mm : 10.70...10.80
Del. quantity cm³/ : 14.5...14.7
100 s: (14.2...15.0)
Spread cm³ : 0.5
100 s: (0.9)
2nd speed rpm : 275.0
Rack travel in mm : 5.3...5.5
Del. quantity cm³/ : 1.3...1.9
100 s: (1.0...2.2)
Spread cm³ : 0.8
100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 550
Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1000
Aneroid pressure h: 1000
Del. quantity : 145.5...147.5
1000 : (142.5...150.5)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Setting point:
Speed rpm : 550
Rack travel in mm : 15.8

Testing:

1st rack travel in: 9.70
Speed rpm : 1200...1215
2nd rack travel in: 4.00
Speed rpm : 1275...1305
4th rack travel in: 1450
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 275
Rack travel in mm : 4.7

Testing:

Speed rpm : 175
Minimum rack trave: 7.00
Speed rpm : 275
Rack travel in mm : 4.60...4.80
Rack travel in mm : 2.00
Speed rpm : 320...360

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 600
Pressure hPa : 1000
Rack travel mm : 10.70...10.80

Measurement

Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 9.40...9.60
2nd pressure hPa : 260
Rack travel in m: 10.30...10.40
3rd pressure hPa : 190
Rack travel in m: 9.80...10.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -
Speed rpm : 600
Del.quantity cm³/ : 119.0...121.0
1000 s: (116.0...124.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.70
Speed rpm : 1200...1215

LOW IDLE

Speed rpm : 275
Rack travel in mm : 4.60...4.80

Remarks:

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF
 Edition : 27.11.92
 Replaces : 02.92
 Test oil : ISO-4113
 Combination no. : 0 402 646 987
 Injection pump
 Pump designation : PE6P120A320RS7218Y
 EP type number : 0 412 626 859
 Governor
 Governor design. : RQ275/1000PA936-2
 Governor no. : 0 421 801 633

Customer-spec. information
 Customer : DAF

Engine : WS 222 L

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.30...5.40
 : (5.25...5.45)
 Rack travel in mm : 14.00...15.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10
 & maximum rack tra: 14.0...15.0
 Difference ° CS : 2.25...3.75

BASIC SETTING

1st speed rpm : 850
 Rack travel in mm : 13.70...13.80
 Del. quantity cm³/ : 19.5...19.7
 100 s: (19.2...20.0)
 Spread cm³ : 0.5
 100 s: (0.9)

2nd speed rpm : 275.0
 Rack travel in mm : 6.3...6.5
 Del. quantity cm³/ : 1.4...2.0
 100 s: (1.1...2.3)
 Spread cm³ : 0.8
 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 550
 Rack travel in mm : 15.40...16.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 850
 Aneroid pressure h: 1000
 Del. quantity : 195.0...197.0
 1000 : (192.0...200.0)
 Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
 Setting point:
 Speed rpm : 550
 Rack travel in mm : 16.0

Testing:

1st rack travel in: 12.70
Speed rpm : 1035...1050
2nd rack travel in: 4.00
Speed rpm : 1130...1160
4th rack travel in: 1250
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 275
Rack travel in mm : 5.0

Testing:

Speed rpm : 175
Minimum rack trave: 7.00
Speed rpm : 275
Rack travel in mm : 4.90...5.10
Rack travel in mm : 2.00
Speed rpm : 330...370

TORQUE CONTROL

Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 850
Rack travel in m: 14.70...14.80
2nd speed rpm : 1000
Rack travel in m: 14.60...14.80

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 600
Pressure hPa : 1000
Rack travel mm : 13.70...13.80

Measurement

Speed 1/min : 600
1st pressure hPa : -
Rack travel in m: 11.60...11.80
2nd pressure hPa : 400
Rack travel in m: 13.20...13.30
3rd pressure hPa : 230
Rack travel in m: 12.00...12.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -
Speed rpm : 600
Del. quantity cm3/ : 139.0...141.0
1000 s: (136.0...144.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.70
Speed rpm : 1035...1050

LOW IDLE

Speed rpm : 275
Rack travel in mm : 4.90...5.10

Remarks:

:
Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 k
 Edition : 18.09.91
 Replaces : G7.90
 Test oil : ISO-4113

Combination no. : 0 402 648 845

Injection pump
 Pump designation : PE8P120A320LS7816
 EP type number : 0 412 628 829
 Governor
 Governor design. : RQV300...1050PA797-5
 Governor no. : 0 421 813 702

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 353.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.60...13.80

Del. quantity cm³/ : 23.6...23.9

100 s: (23.3...24.2)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 300.0
 Rack travel in mm : 5.9...6.5
 Del. quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)
 Spread cm³ : 0.5
 100 s: (0.8)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
 travel mm : 1.20...1.40
 2nd speed rpm : 800
 travel mm : 5.80...6.10
 3rd speed rpm : 1120
 travel mm : 8.20...8.80
 4th speed rpm : 1180
 travel mm : 9.60...10.40

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1100
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600
Aneroid pressure h: 900
Del. quantity : 236.0...239.0
1000 : (233.0...242.0)
Spread cm³ : 4.00
1000 : (7.00)

RATED SPEED

1st version
Control Lever
position degrees: 117...125

Testing:
1st rack travel in: 13.40
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1160...1190
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1
Control Lever
position degrees: 82...90

Testing:
Speed rpm : 200
Minimum rack travel: 8.00
Speed rpm : 300
Rack travel in mm : 5.90...6.50

CONSTANT REGULATION
Speed rpm : 300...500

TORQUE CONTROL
Dimension a mm : 1.30
2nd speed rpm : 1050
Rack travel in m: 14.40...14.60
3rd speed rpm : 800
Rack travel in m: 14.90...15.10

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 13.60...13.80

Measurement
Speed 1/min : 600

1st pressure hPa : 350
Rack travel in m: 11.10...11.30
2nd pressure hPa : 650
Rack travel in m: 12.80...13.00
3rd pressure hPa : 1050
Rack travel in m: 13.70...13.80 *

4th pressure hPa : 1350
Rack travel in m: 15.00...15.20
5th pressure hPa : -
Rack travel in m: 10.20...10.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1600
Speed rpm : 1050
Del. quantity cm³/ : 248.0...252.0
1000 s: (245.0...255.0)
Spread cm³ : 7.00
1000 s: (10.0)
Aneroid pressure h: 1600
Speed rpm : 800
Del. quantity cm³/ : 265.0...269.0
1000 s: (262.0...272.0)
Spread cm³ : 7.00
1000 s: (10.0)
Aneroid pressure h: -
Speed rpm : 500
Del. quantity cm³/ : 145.0...147.0
1000 s: (142.0...150.0)
Spread cm³ : 7.00
1000 s: (10.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.40
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 240.0...260.0
1000 s: (236.0...264.0)

Remarks:

* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 23.10.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 648 845
 Injection pump
 Pump designation : PE8P120A32QLS7816-10
 EP type number : 0 412 628 836
 Governor
 Governor design. : RQV300...1050PA797-5
 Governor no. : 0 421 813 702

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 353.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600
 Rack travel in mm : 13.60...13.80
 Del.quantity cm³/ : 23.6...23.9
 100 s: (23.3...24.2)
 Spread cm³ : 0.4
 100 s: (0.7)

2nd speed rpm : 300.0
 Rack travel in mm : 5.9...6.5
 Del.quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)
 Spread cm³ : 0.5
 100 s: (0.8)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
 travel mm : 1.20...1.40
 2nd speed rpm : 800
 travel mm : 5.80...6.10
 3rd speed rpm : 1120
 travel mm : 8.20...8.80
 4th speed rpm : 1180
 travel mm : 9.60...10.40

GUIDE SLEEVE POSITION

Control-Lever position
 Degree: -1
 Speed rpm : 1100
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600
Aneroid pressure h: 900
Del.quantity : 236.0...239.0
1000 : (233.0...242.0)
Spread cm³ : 4.00
1000 : (7.00)

RATED SPEED

1st version
Control lever
position degrees: 117...125

Testing:
1st rack travel in: 13.40
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1160...1190
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 82...90

Testing:
Speed rpm : 200
Minimum rack travel: 8.00
Speed rpm : 300
Rack travel in mm : 5.90...6.50

CONSTANT REGULATION
Speed rpm : 300...500

TORQUE CONTROL
Dimension a mm : 1.30
2nd speed rpm : 1050
Rack travel in m: 14.40...14.60
3rd speed rpm : 800
Rack travel in m: 14.90...15.10

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 13.60...13.80

Measurement
Speed 1/min : 600

1st pressure hPa : 350
Rack travel in m: 11.10...11.30
2nd pressure hPa : 650
Rack travel in m: 12.80...13.00
3rd pressure hPa : 1050
Rack travel in m: 13.70...13.80 *

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4th pressure hPa : 1350
Rack travel in m: 15.00...15.20
5th pressure hPa : -
Rack travel in m: 10.20...10.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1600
Speed rpm : 1050
Del.quantity cm³/ : 248.0...252.0
1000 s: (245.0...255.0)
Spread cm³ : 7.00
1000 s: (10.0)
Aneroid pressure h: 1600
Speed rpm : 800
Del.quantity cm³/ : 265.0...269.0
1000 s: (262.0...272.0)
Spread cm³ : 7.00
1000 s: (10.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 145.0...147.0
1000 s: (142.0...150.0)
Spread cm³ : 7.00
1000 s: (10.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.40
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 240.0...260.0
1000 s: (236.0...264.0)

Remarks:

* Increase in control-rod travel with
respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : FIA 17,2 e
 Edition : 27.11.92
 Replaces : 09.91
 Test oil : ISO-4113
 Combination no. : 0 402 648 854
 Injection pump
 Pump designation : PE8P130A920/5LS7822
 EP type number : 0 412 638 802
 Governor
 Governor design. : RGV300...950PA905
 Governor no. : 0 421 813 723

Customer-spec. information
 Customer : IVECO-FIAT

Engine : 8280.42.001

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 40...45
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 1 688 901 105
 Opening pressure, bar : 207...210
 Orifice plate diameter mm : 0,8
 Test lines : 1 688 750 075
 Outside diameter x Wall thickness x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 5.10...5.20
 : (5.05...5.25)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 4- 3- 6- 5-
 7- 2

Phasing : 0-45-90-135-180-225-
 270-315
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 550
 Rack travel in mm : 11.40...11.50
 Del. quantity cm³/ : 22.1...22.3
 100 s: (21.8...22.6)
 Spread cm³ : 0.8
 100 s: (1.2)

2nd speed rpm : 300.0
 Rack travel in mm : 6.1...6.5
 Del. quantity cm³/ : 2.4...3.0
 100 s: (2.0...3.4)
 Spread cm³ : 0.6
 100 s: (1.0)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225
 travel mm : 0.60...1.10
 2nd speed rpm : 350
 travel mm : 2.10...2.50
 3rd speed rpm : 600
 travel mm : 3.80...4.40
 4th speed rpm : 950
 travel mm : 7.20...7.40
 5th speed rpm : 1200
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1020
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 550
 Aneroid pressure h: 900
 Del. quantity : 221.0...223.0
 1000 : (218.0...226.0)

Spread cm³ : 8.00
1000 : (12.00)

RATED SPEED

1st version
Control lever
position degrees: 109...117

Testing:
1st rack travel in: 10.40
Speed rpm : 995...1005
2nd rack travel in: 4.00
Speed rpm : 1080...1110
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 63...71

Testing:
Speed rpm : 200
Minimum rack travel: 7.70
Speed rpm : 300
Rack travel in mm : 6.20...6.40

CONSTANT REGULATION
Speed rpm : 380...480

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 11.40...11.50

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.40...9.70
2nd pressure hPa : 390
Rack travel in m: 10.90...11.00
3rd pressure hPa : 330
Rack travel in m: 9.80...10.00

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 950
Del.quantity cm³/ : 215.0...221.0
1000 s: (212.0...224.0)
Aneroid pressure h: -
Speed rpm : 500

Del.quantity cm³/ : 161.0...163.0
1000 s: (158.0...166.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.40
Speed rpm : 995...1005

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 240.0...270.0
1000 s: (236.0...274.0)

Remarks:

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,
the start position must be reached.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA
Edition : 30.10.92
Replaces : 04.92
Test oil : ISO-4113
Combination no. : 0 402 648 874
Injection pump
Pump designation : PE8P120A920/4LS7189
EP type number : 0 412 628 840
Governor
Governor design. : RQV200...950PA736-8
Governor no. : 0 421 813 815

Customer-spec. information
Customer : SCANIA

Engine : DSC14 10

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42
Overflow valve : 1 417 413 025
Inlet press., bar : 1.50
Test nozzle holder assembly : 1 688 901 104
Opening pressure, bar : 250...253
Orifice plate diameter mm : 0,7
Test lines : 1 680 750 008
Outside diameter x Wall thickness x Length mm : 6.00x2.00x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
Prestroke mm : 5.00...5.10
: (4.95...5.15)
Rack travel in mm : 9.00...12.00

E20

Firing order : 1- 2- 7- 3- 4- 5- 6- 8

Phasing : 0-45-90-135-180-225-270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700
Rack travel in mm : 13.00...13.10
Del.quantity cm3/ : 23.7...23.9
100 s: (23.4...24.2)
Spread cm3 : 0.8
100 s: (1.2)

2nd speed rpm : 250.0
Rack travel in mm : 4.4...4.8
Del.quantity cm3/ : 1.2...1.6
100 s: (-)
Spread cm3 : 0.4
100 s: (0.8)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
travel mm : 1.40...1.80
2nd speed rpm : 350
travel mm : 2.30...2.90
3rd speed rpm : 650
travel mm : 4.40...5.00
4th speed rpm : 995
travel mm : 7.70...7.90
5th speed rpm : 1115
travel mm : 9.20...9.60

GUIDE SLEEVE POSITION

Control-lever position
Degree: -1
Speed rpm : 1150
Rack travel in mm : 7.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 700
Aneroid pressure h: 900
Del.quantity : 237.0...239.0
1000 : (234.0...242.0)

Spread cm³ : 8.00
1000 : (12.00)

RATED SPEED

1st version
Control lever
position degrees: 90...98

Testing:
1st rack travel in: 12.00
Speed rpm : 990...1000
2nd rack travel in: 4.00
Speed rpm : 1100...1130
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 41...49

Testing:
Speed rpm : 100
Minimum rack travel: 6.00
Speed rpm : 250
Rack travel in mm : 4.40...4.60
Rack travel in mm : 2.00
Speed rpm : 375...435

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 13.00...13.10

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.80...10.20
2nd pressure hPa : 525
Rack travel in m: 11.70...11.80
3rd pressure hPa : 320
Rack travel in m: 10.40...10.60

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 950
Del.quantity cm³/ : 220.0...228.0
1000 s: (218.0...230.0)
Aneroid pressure h: -
Speed rpm : 500

Del.quantity cm³/ : 142.0...146.0
1000 s: (140.0...148.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.00
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 130.0...180.0
1000 s: (-)
Rack travel in mm : 9.80...10.20

LOW IDLE

Speed rpm : 250
Rack travel in mm : 4.40...4.60

Remarks:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring
preload on new delivery-valve holders
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO
diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : SCA 14,2 o
 Edition : 30.10.92
 Replaces : 11.91
 Test oil : ISO-4113
 Combination no. : 0 402 648 891
 Injection pump
 Pump designation : PE8P120A920/4LS7189Q
 EP type number : 0 412 628 858
 Governor
 Governor design. : RQV200...950PA736-8
 Governor no. : 0 421 813 815

Customer-spec. information
 Customer : SCANIA

Engine : DSC14 08

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 1 688 901 104
 Opening
 pressure, bar : 250...253
 Orifice plate
 diameter mm : 0,7
 Test lines : 1 680 750 008
 Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 5.00...5.10
 : (4.95...5.15)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5-
 6- 8

Phasing : 0-45-90-135-180-225-
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700
 Rack travel in mm : 12.30...12.40
 Del.quantity cm³/ : 21.9...22.1
 100 s : (21.6...22.4)
 Spread cm³ : 0.8
 100 s : (1.2)

2nd speed rpm : 250.0
 Rack travel in mm : 4.4...4.8
 Del.quantity cm³/ : 1.2...1.6
 100 s : (-)
 Spread cm³ : 0.4
 100 s : (0.8)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
 travel mm : 1.40...1.80
 2nd speed rpm : 350
 travel mm : 2.30...2.90
 3rd speed rpm : 650
 travel mm : 4.40...5.00
 4th speed rpm : 995
 travel mm : 7.70...7.90
 5th speed rpm : 1115
 travel mm : 9.20...9.60

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1150
 Rack travel in mm : 7.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700
 Aneroid pressure h: 900
 Del.quantity : 219.0...221.0
 1000 : (216.0...224.0)

Spread cm³ : 8.00
1000 : (12.00)

RATED SPEED

1st version
Control lever
position degrees: 90...98

Testing:
1st rack travel in: 11.30
Speed rpm : 990...1000
2nd rack travel in: 4.00
Speed rpm : 1090...1120
4th rack travel in: 1250
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 40...48

Testing:
Speed rpm : 100
Minimum rack travel: 6.00
Speed rpm : 250
Rack travel in mm : 4.40...4.60
Rack travel in mm : 2.00
Speed rpm : 375...435

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 12.30...12.40

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.80...10.20
2nd pressure hPa : 525
Rack travel in m: 11.70...11.80
3rd pressure hPa : 320
Rack travel in m: 10.40...10.60

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 950
Del.quantity cm³/ : 202.0...210.0
1000 s: (200.0...212.0)
Aneroid pressure h: -
Speed rpm : 500

Del.quantity cm³/ : 142.0...146.0
1000 s: (140.0...148.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.30
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 130.0...180.0
1000 s: (-)
Rack travel in mm : 9.80...10.20

LOW IDLE

Speed rpm : 250
Rack travel in mm : 4.40...4.60

Remarks:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring
preload on new delivery-valve holders
to 2.9...3.1 mm.

Start-of-delivery setting with RO80
diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 648 898X
 Injection pump
 Pump designation : PE8P120A320LS7838-10
 EP type number : 0 412 628 854
 Governor
 Governor design. : RQ300/950PA971-4
 Governor no. : 0 421 801 558

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kw : 320.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 : 4 1

Phasing : 0-45-90-135-180-225-
 : 270-315
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600
 Rack travel in mm : 14.40...14.50
 Del. quantity cm³/ : 23.5...23.7
 : 100 s: (23.2...24.0)

Spread cm³ : 0.6
 : 100 s: (0.9)

2nd speed rpm : 300.0
 Rack travel in mm : 6.2...6.8
 Del. quantity cm³/ : 1.6...2.2
 : 100 s: (1.3...2.5)
 Spread cm³ : 0.6
 : 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 600
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 600
 Aneroid pressure h: 1200
 Del. quantity : 235.0...237.0
 : 1000 : (232.0...240.0)
 Spread cm³ : 6.00
 : 1000 : (9.00)

RATED SPEED

1st version
 Setting point:
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.20

Speed rpm : 990...1005

2nd rack travel in: 4.00

Speed rpm : 1070...1100

4th rack travel in: 1150

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.5

Testing:

Speed rpm : 200

Minimum rack travel: 7.80

Speed rpm : 300

Rack travel in mm : 6.40...6.60

Rack travel in mm : 2.00

Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 600

Rack travel in m: 14.40...14.50

2nd speed rpm : 950

Rack travel in m: 14.20...14.40

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : -

Rack travel mm : 8.90...9.20

Measurement

Speed 1/min : 500

1st pressure hPa : 250

Rack travel in m: 9.70...9.80

2nd pressure hPa : 550

Rack travel in m: 12.80...13.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 950

Del.quantity cm³/ : 230.0...234.0

1000 s: (227.0...237.0)

Spread cm³ : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm³/ : 132.0...134.0

1000 s: (129.0...137.0)

Spread cm³ : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.20

Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100

Rack travel in mm : 8.90...9.30

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 23.10.92
 Replaces : 06.92
 Test oil : ISO-4113
 Combination no. : 0 402 648 899
 Injection pump
 Pump designation : PE8P120A320LS7839-10
 EP type number : 0 412 628 855
 Governor
 Governor design. : RQ300/950PA971-5
 Governor no. : 0 421 801 559

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 370.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10
 : (4.95...5.15)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.90...15.10

Del. quantity cm³/ : 25.6...25.8

100 s: (25.3...26.1)

Spread cm³ : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.6

Del. quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del. quantity : 256.0...258.0

1000 : (253.0...261.0)

Spread cm³ : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 15.30
Speed rpm : 990...1005
2nd rack travel in: 4.00
Speed rpm : 1075...1105
4th rack travel in: 1150
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.3

Testing:

Speed rpm : 200
Minimum rack travel: 7.60
Speed rpm : 300
Rack travel in mm : 6.20...6.40
Rack travel in mm : 2.00
Speed rpm : 370...410

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 14.90...15.10

Measurement

Speed 1/min : 600

1st pressure hPa : 250
Rack travel in m: 9.90...10.10
2nd pressure hPa : 700
Rack travel in m: 13.90...14.10
3rd pressure hPa : 1100
Rack travel in m: 15.10...15.20
4th pressure hPa : 1400
Rack travel in m: 15.70...15.90
5th pressure hPa : -
Rack travel in m: 9.10...9.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 2000
Speed rpm : 950
Del. quantity cm³/ : 279.0...282.0
1000 s: (276.0...285.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: 2000
Speed rpm : 800

Del. quantity cm³/ : 286.0...290.0
1000 s: (283.0...293.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del. quantity cm³/ : 132.0...134.0
1000 s: (129.0...137.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 15.30
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 80.0...100.0
1000 s: (76.0...104.0)
Rack travel in mm : 9.10...9.50

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 23.10.92
 Replaces : 09.92
 Test oil : ISO-4113
 Combination no. : 0 402 648 902
 Injection pump
 Pump designation : PE&P120A320LS7839-10
 EP type number : 0 412 628 855
 Governor
 Governor design. : RQ300/1050PA972-5
 Governor no. : 0 421 801 564

Customer-spec. information
 Customer : MERCEDERS-BENZ

Engine : OM442 LA

1st version kW : 370.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10
 : (4.95...5.15)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600
 Rack travel in mm : 14.90...15.10
 Del.quantity cm³/ : 25.6...25.8
 100 s: (25.3...26.1)
 Spread cm³ : 0.6
 100 s: (0.9)

2nd speed rpm : 300.0
 Rack travel in mm : 6.0...6.6
 Del.quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)
 Spread cm³ : 0.6
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -2
 Speed rpm : 600
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 600
 Aneroid pressure h: 900
 Del.quantity : 256.0...258.0
 1000 : (253.0...261.0)
 Spread cm³ : 6.00
 1000 : (9.00)

RATED SPEED

1st version
 Setting point:
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 15.20
Speed rpm : 1090...1105
2nd rack travel in: 4.00
Speed rpm : 1150...1190
4th rack travel in: 1250
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.3

Testing:

Speed rpm : 200
Minimum rack travel: 7.80
Speed rpm : 300
Rack travel in mm : 6.20...6.40
Rack travel in mm : 2.00
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?
2nd speed rpm : 1050
Rack travel in m: 16.20...16.40
3rd speed rpm : 800
Rack travel in m: 16.40...16.60

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 14.90...15.10

Measurement

Speed 1/min : 600
1st pressure hPa : 250
Rack travel in m: 9.90...10.10
2nd pressure hPa : 700
Rack travel in m: 13.90...14.10
3rd pressure hPa : 1100
Rack travel in m: 15.10...15.20
4th pressure hPa : 1400
Rack travel in m: 15.70...15.90
5th pressure hPa : -
Rack travel in m: 9.10...9.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 2000
Speed rpm : 1050

F01

Del.quantity cm³/ : 271.0...274.0
1000 s: (268.0...277.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: 2000
Speed rpm : 800
Del.quantity cm³/ : 276.0...280.0
1000 s: (273.0...283.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 132.0...134.0
1000 s: (129.0...137.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 15.20
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100
Rack travel in mm : 9.10...9.50

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 03.12.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 648 906X
 Injection pump
 Pump designation : PE8P120A320LS7838-10
 EP type number : 0 412 628 854
 Governor
 Governor design. : RQ300/1050PA972-6
 Governor no. : 0 421 801 569

Cust. part no. : 0200743602

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kw : 320.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.40...14.50

Del. quantity cm³/ : 23.7...23.9

100 s: (23.4...24.2)

Spread cm³ : 0.6

100 s: (0.9)

2nd speed rpm : 300.0
 Rack travel in mm : 6.2...6.8
 Del. quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)

Spread cm³ : 0.6
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -2
 Speed rpm : 600
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 600
 Aneroid pressure h: 1200
 Del. quantity : 237.0...239.0
 1000 : (234.0...242.0)
 Spread cm³ : 6.00
 1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600
Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.20
Speed rpm : 1090...1105
2nd rack travel in: 4.00
Speed rpm : 1165...1195
4th rack travel in: 12.50
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.5

Testing:

Speed rpm : 200
Minimum rack travel: 7.80
Speed rpm : 300
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 300...500

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 600
Rack travel in m: 14.40...14.50
2nd speed rpm : 1050
Rack travel in m: 14.20...14.40

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : -
Rack travel mm : 8.90...9.20

Measurement

Speed 1/min : 500

1st pressure hPa : 250
Rack travel in m: 9.70...9.80
2nd pressure hPa : 600
Rack travel in m: 12.80...13.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 1050
Del.quantity cm3/ : 222.0...226.0
1000 s: (219.0...229.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 132.0...134.0
1000 s: (129.0...137.0)
Spread cm3 : 8.00
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.20
Speed rpm : 1090...1105

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 30.10.92
 Replaces : 07.92
 Test oil : ISO-4113
 Combination no. : 0 402 648 907
 Injection pump
 Pump designation : PE8P120A32OLS?839-10
 EP type number : 0 412 628 855
 Governor
 Governor design. : RGV300...950PA797-22
 Governor no. : 0 421 813 909

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 370.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10
 : (4.95...5.15)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.90...15.10

Del.quantity cm³/ : 25.6...25.8

100 s: (25.3...26.1)

Spread cm³ : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.6

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.6

100 s: (1.0)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
 travel mm : 1.00...1.50

2nd speed rpm : 617
 travel mm : 5.00...5.50

3rd speed rpm : 780
 travel mm : 6.10...6.60

4th speed rpm : 1010
 travel mm : 8.30...8.80

5th speed rpm : 1092
 travel mm : 9.80...10.30

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1050

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 600
Aneroid pressure h: 900
Del.quantity : 256.0...258.0
1000 : (253.0...261.0)
Sread cm³ : 6.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 118...126

Testing:
1st rack travel in: 15.00
Speed rpm : 990...1000
2nd rack travel in: 4.00
Speed rpm : 1100...1130
4th rack travel in: 1200
Speed rpm : 0.00...1.40

LOW IDLE 1
Control lever
position degrees: 82...90

Testing:
Speed rpm : 200
Minimum rack trave: 8.00
Speed rpm : 300
Rack travel in mm : 6.20...6.40

CONSTANT REGULATION
Speed rpm : 300...400

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 14.90...15.10

Measurement
Speed 1/min : 600

1st pressure hPa : 250
Rack travel in m: 9.90...10.10
2nd pressure hPa : 700
Rack travel in m: 13.90..14.10
3rd pressure hPa : 1100
Rack travel in m: 15.10...15.20
4th pressure hPa : 1400
Rack travel in m: 15.70...15.90
5th pressure hPa : -
Rack travel in m: 9.10...9.40

START CUT-OUT

Speed 1/min : 240 (260)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 2000
Speed rpm : 950
Del.quantity cm³/ : 279.0...282.0
1000 s: (276.0...285.0)
Sread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: 2000
Speed rpm : 800
Del.quantity cm³/ : 286.0...290.0
1000 s: (283.0...286.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 132.0...134.0
1000 s: (129.0...137.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 15.00
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 275.0...295.0
1000 s: (271.0...299.0)

Remarks: :

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 648 908X
 Injection pump
 Pump designation : PE8P120A320LS7838-10
 EP type number : 0 412 628 854
 Governor
 Governor design. : RQV300...950PA797-23
 Governor no. : 0 421 813 910

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kw : 320.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600
 Rack travel in mm : 14.40...14.50
 Del. quantity cm³/ : 23.5...23.7
 100 s: (23.2...24.0)

Spread cm³ : 0.6
 100 s: (0.9)

2nd speed rpm : 300.0
 Rack travel in mm : 5.4...5.8
 Del. quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)
 Spread cm³ : 0.6
 100 s: (1.0)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
 travel mm : 1.00...1.50
 2nd speed rpm : 617
 travel mm : 5.00...5.50
 3rd speed rpm : 780
 travel mm : 6.10...6.60
 4th speed rpm : 1009
 travel mm : 8.30...8.80
 5th speed rpm : 1092
 travel mm : 9.80...10.30

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1020
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 600
Aneroid pressure h: 1200
Del.quantity : 235.0...237.0
1000 : (232.0...240.0)
Spread cm3 : 6.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 120...128

Testing:

1st rack travel in: 13.20
Speed rpm : 990...1000
2nd rack travel in: 4.00
Speed rpm : 1080...1110
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 82...90

Testing:

Speed rpm : 200
Minimum rack travel: 7.80
Speed rpm : 300
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 300...500

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 600
Rack travel in m: 14.40...14.50
2nd speed rpm : 950
Rack travel in m: 14.20...14.40

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 8.90...9.20

Measurement

Speed 1/min : 500

1st pressure hPa : 250
Rack travel in m: 9.70...9.80
2nd pressure hPa : 550

F07

Rack travel in m: 12.80...13.00

START CUT-OUT

Speed 1/min : 240 (260)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 950
Del.quantity cm3/ : 230.0...234.0
1000 s: (227.0...237.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 132.0...134.0
1000 s: (129.0...137.0)
Spread cm3 : 8.00
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 13.20
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 220.0...240.0
1000 s: (216.0...244.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 23.10.92
 Replaces : 08.92
 Test oil : ISO-4113
 Combination no. : 0 402 648 911
 Injection pump
 Pump designation : PE8P120A320LS7839-10
 EP type number : 0 412 628 855
 Governor
 Governor design. : RGV300...1050PA797
 -27
 Governor no. : 0 421 813 916

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 370.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10
 : (4.95...5.15)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.90...15.10

Del.quantity cm3/ : 25.6...25.8

100 s: (25.3...26.1)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.6

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
 travel mm : 1.00...1.50

2nd speed rpm : 558
 travel mm : 4.30...4.80

3rd speed rpm : 820
 travel mm : 5.90...6.40

4th speed rpm : 1108
 travel mm : 8.30...8.80

5th speed rpm : 1183
 travel mm : 8.30...8.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600
Aneroid pressure h: 900
Del.quantity : 256.0...258.0
1000 : (253.0...261.0)
Spread cm3 : 6.00
1000 : (9.00)

RATED SPEED

1st version

Control lever
position degrees: 118...126

Testing:

1st rack travel in: 15.20
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1175...1205
4th rack travel in: 1250
Speed rpm : 0.00...1.50

LOW IDLE 1

Control lever
position degrees: 76...84

Testing:

Speed rpm : 200
Minimum rack trave: 6.80
Speed rpm : 300
Rack travel in mm : 6.20...6.40

CONSTANT REGULATION

Speed rpm : 300...450

TORQUE CONTROL

Dimension a mm : ?
2nd speed rpm : 1050
Rack travel in m: 16.20...16.40
3rd speed rpm : 800
Rack travel in m: 16.40...16.60

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 14.90...15.10

Measurement

Speed 1/min : 600
1st pressure hPa : 250
Rack travel in m: 9.90...10.10
2nd pressure hPa : 700

F09

Rack travel in m: 13.90...14.10
3rd pressure hPa : 1100
Rack travel in m: 15.10...15.20

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 2000
Speed rpm : 1050
Del.quantity cm3/ : 271.0...274.0
1000 s: (268.0...277.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: 2000
Speed rpm : 800
Del.quantity cm3/ : 276.0...280.0
1000 s: (273.0...283.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 132.0...134.0
1000 s: (129.0...137.0)
Spread cm3 : 8.00
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 15.20
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 275.0...295.0
1000 s: (271.0...299.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 23.10.92
 Replaces : 08.92
 Test oil : ISO-4113
 Combination no. : 0 402 648 917
 Injection pump
 Pump designation : PE8P120A320LS7839-10
 EP type number : 0 412 628 855
 Governor
 Governor design. : RQ300/1050PA993-3
 Governor no. : 0 421 801 601

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 370.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10
 : (4.95...5.15)
 Rack travel in mm : 20.00...21.00
 Firing order : 3- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.90...15.10

Del.quantity cm³/ : 25.6...25.8

100 s: (25.3...26.1)

Spread cm³ : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.6

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del.quantity : 256.0...258.0

1000 : (253.0...261.0)

Spread cm³ : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 15.20
Speed rpm : 1090...1105
2nd rack travel in: 4.00
Speed rpm : 1160...1190
4th rack travel in: 1250
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.3

Testing:

Speed rpm : 200
Minimum rack travel: 7.20
Speed rpm : 300
Rack travel in mm : 6.20...6.40
Rack travel in mm : 2.00
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?
2nd speed rpm : 1050
Rack travel in m: 16.20...16.40
3rd speed rpm : 800
Rack travel in m: 16.40...16.60

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 14.90...15.10

Measurement

Speed 1/min : 600

1st pressure hPa : 250
Rack travel in m: 9.90...10.10
2nd pressure hPa : 700
Rack travel in m: 13.90...14.10
3rd pressure hPa : 1100
Rack travel in m: 15.10...15.20
4th pressure hPa : 1400
Rack travel in m: 15.70...15.90
5th pressure hPa : -
Rack travel in m: 9.10...9.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 2000
Speed rpm : 1050
Del.quantity cm³/ : 271.0...274.0
1000 s: (268.0...277.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: 2000
Speed rpm : 800
Del.quantity cm³/ : 276.0...280.0
1000 s: (273.0...283.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 132.0...134.0
1000 s: (129.0...137.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 15.20
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 275.0...295.0
1000 s: (271.0...299.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 03.12.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 648 918X
 Injection pump
 Pump designation : PE8P120A320LS7838-10
 EP type number : 0 412 628 854
 Governor
 Governor design. : RQ300/1050PA993-4
 Governor no. : 0 421 801 602
 Cust. part no. : 021074102
 Customer-spec. information
 Customer : MERCEDES-BENZ
 Engine : OM442 LA
 1st version kW : 320.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve
 : 1 417 413 025
 Inlet press., bar : 1.50
 Overflow
 quantity min. 1/h: 100...120
 Test nozzle holder
 assembly : 1 688 901 105
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,8
 Test lines : 1 680 750 075
 Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1
 Phasing : 0-45-90-135-180-225-
 270-315
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600
 Rack travel in mm : 14.40...14.50
 Del.quantity cm³/ : 23.7...23.9
 100 s: (23.4...24.2)
 Spread cm³ : 0.6
 100 s: (0.9)
 2nd speed rpm : 300.0
 Rack travel in mm : 6.2...6.8
 Del.quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)
 Spread cm³ : 0.6
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -2
 Speed rpm : 1020
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 600
 Aneroid pressure h: 1200
 Del.quantity : 237.0...239.0
 1000 : (234.0...242.0)
 Spread cm³ : 6.00
 1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 1020
Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.20
Speed rpm : 1090...1105
2nd rack travel in: 4.00
Speed rpm : 1165...1195
4th rack travel in: 1250
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.5

Testing:

Speed rpm : 200
Minimum rack travel: 7.80
Speed rpm : 300
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 300...500

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 600
Rack travel in m: 14.40...14.50
2nd speed rpm : 1050
Rack travel in m: 14.20...14.40

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : -
Rack travel mm : 8.90...9.20

Measurement

Speed 1/min : 500
1st pressure hPa : 250
Rack travel in m: 9.70...9.80
2nd pressure hPa : 600
Rack travel in m: 13.80...14.00

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

F13

1st version

Aneroid pressure h: 1200
Speed rpm : 1050
Del. quantity cm³/ : 222.0...226.0
1000 s: (219.0...229.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del. quantity cm³/ : 132.0...134.0
1000 s: (129.0...134.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 13.20
Speed rpm : 1090...1105

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 23.10.92
 Replaces : 06.92
 Test oil : ISO-4113
 Combination no. : 0 402 648 921
 Injection pump
 Pump designation : PE8P120A320LS7839-10
 EP type number : 0 412 628 855
 Governor
 Governor design. : RQ300/950PA993-8
 Governor no. : 0 421 801 618

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kw : 370.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Overflow quantity min. 1/h: 100...120
 Test nozzle holder assembly : 1 688 901 105
 Opening pressure, bar : 207...210
 Orifice plate diameter mm : 0,8
 Test lines : 1 680 750 075
 Outside diameter x Wall thickness x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 5.00...5.10
 : (4.95...5.15)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 : 4- 1
 Phasing : 0-45-90-135-180-225-
 : 270-315
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600
 Rack travel in mm : 14.90...15.10
 Del.quantity cm3/ : 25.6...25.8
 : 100 s: (25.3...26.1)
 Spread cm3 : 0.6
 : 100 s: (0.9)
 2nd speed rpm : 300.0
 Rack travel in mm : 6.0...6.6
 Del.quantity cm3/ : 1.6...2.2
 : 100 s: (1.3...2.5)
 Spread cm3 : 0.6
 : 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -2
 Speed rpm : 600
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 600
 Aneroid pressure h: 900
 Del.quantity : 256.0...258.0
 : 1000 : (253.0...261.0)
 Spread cm3 : 6.00
 : 1000 : (9.00)

RATED SPEED

1st version
 Setting point:
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 15.30
Speed rpm : 990...1005
2nd rack travel in: 4.00
Speed rpm : 1075...1105
4th rack travel in: 1150
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.3

Testing:

Speed rpm : 200
Minimum rack travel: 7.60
Speed rpm : 300
Rack travel in mm : 6.20...6.40
Rack travel in mm : 2.00
Speed rpm : 380...420

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 14.90...15.10

Measurement

Speed 1/min : 600

1st pressure hPa : 250
Rack travel in m: 9.90...10.10
2nd pressure hPa : 700
Rack travel in m: 13.90...14.10
3rd pressure hPa : 1100
Rack travel in m: 15.10...15.20
4th pressure hPa : 1400
Rack travel in m: 15.70...15.90
5th pressure hPa : -
Rack travel in m: 9.10...9.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 2000
Speed rpm : 950
Del.quantity cm3/ : 279.0...282.0
1000 s: (276.0...285.0)

Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: 2000
Speed rpm : 800
Del.quantity cm3/ : 286.0...290.0
1000 s: (283.0...293.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 132.0...134.0
1000 s: (129.0...137.0)
Spread cm3 : 8.00
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 15.30
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 260.0...280.0
1000 s: (256.0...284.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 u 4
 Edition : 23.10.92
 Replaces : 04.92
 Test oil : ISO-4113
 Combination no. : 0 402 648 926
 Injection pump
 Pump designation : PE8P120A320LS7840
 EP type number : 0 412 628 850
 Governor
 Governor design. : RQ300/1050PA972-9
 Governor no. : 0 421 801 632

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 250.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600
 Rack travel in mm : 12.70...12.90
 Del. quantity cm³/ : 19.1...19.3
 100 s: (18.8...19.6)
 Spread cm³ : 0.6
 100 s: (0.9)

2nd speed rpm : 600.0
 Rack travel in mm : 4.2...4.8
 Del. quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)
 Spread cm³ : 0.6
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -2
 Speed rpm : 600
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 600
 Aneroid pressure h: 700
 Del. quantity : 191.0...193.0
 1000 : (188.0...196.0)
 Spread cm³ : 6.00
 1000 : (9.00)

RATED SPEED

1st version
 Setting point:
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.50
Speed rpm : 1090...1105
2nd rack travel in: 4.00
Speed rpm : 1170...1200
4th rack travel in: 1250
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.5

Testing:

Speed rpm : 200
Minimum rack travel: 7.90
Speed rpm : 300
Rack travel in mm : 6.20...6.80
Rack travel in mm : 2.00
Speed rpm : 380...420

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 600
Pressure hPa : 700
Rack travel mm : 12.70...12.90

Measurement

Speed 1/min : 600

1st pressure hPa : 250
Rack travel in m: 11.10...11.30
2nd pressure hPa : 440
Rack travel in m: 12.40...12.60
3rd pressure hPa : 900
Rack travel in m: 12.90...13.10
4th pressure hPa : -
Rack travel in m: 10.70...11.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1300
Speed rpm : 1050
Del.quantity cm³/ : 210.0...213.0
1000 s: (207.0...216.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: 1300
Speed rpm : 800
Del.quantity cm³/ : 212.0...216.0
1000 s: (209.0...219.0)

Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 132.0...134.0
1000 s: (129.0...137.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 12.50
Speed rpm : 1090...1105

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : 08.92
 Test oil : ISO-4113

Combination no. : 0 402 648 933

Injection pump
 Pump designation : PE8P120A320LS7647
 EP type number : 0 412 628 863
 Governor
 Governor design. : RQ300/950PA1031-3
 Governor no. : 0 421 801 646

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kW : 280.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60
 : (5.45...5.65)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 700

 Rack travel in mm : 13.50...13.60

 Del. quantity cm³/ : 23.3...23.5
 100 s: (23.0...23.8)

 Spread cm³ : 0.6
 100 s: (0.9)

2nd speed rpm : 300.0
 Rack travel in mm : 5.2...5.8
 Del. quantity cm³/ : 1.0...1.6
 100 s: (0.7...1.9)
 Spread cm³ : 0.6
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -2
 Speed rpm : 600
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700
 Aneroid pressure h: 1200
 Del. quantity : 233.0...235.0
 1000 : (230.0...238.0)
 Spread cm³ : 6.00
 1000 : (9.00)

RATED SPEED

1st version
 Setting point:
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.00
Speed rpm : 990...1005
2nd rack travel in: 4.00
Speed rpm : 1060...1090
4th rack travel in: 1350
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.5

Testing:

Speed rpm : 200
Minimum rack travel: 7.90
Speed rpm : 300
Rack travel in mm : 5.40...5.60
Rack travel in mm : 2.00
Speed rpm : 360...400

TORQUE CONTROL

Dimension a mm : 0.55
Torque control curve - 1st version
1st speed rpm : 950
Rack travel in m: 12.90...13.10
2nd speed rpm : 800
Rack travel in m: 13.90...14.10
3rd speed rpm : 700
Rack travel in m: 14.50...14.70

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.50...10.70

Measurement

Speed 1/min : 500
1st pressure hPa : 300
Rack travel in m: 11.10...11.20
2nd pressure hPa : 650
Rack travel in m: 12.60...12.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 950
Del.quantity cm3/ : 214.0...218.0
1000 s: (211.0...221.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 134.0...136.0
1000 s: (131.0...139.0)
Spread cm3 : 8.00
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 12.00
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 260.0...280.0
1000 s: (256.0...284.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : 08.92
 Test oil : ISO-4113
 Combination no. : 0 402 648 941
 Injection pump
 Pump designation : PE8P120A320LS7847
 EP type number : 0 412 628 863
 Governor
 Governor design. : RQV300...950PA1033-7
 Governor no. : 0 421 814 019

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM402 LA
 1st version kW : 280.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 95...115

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60
 : (5.45...5.65)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600
 Rack travel in mm : 13.30...13.40
 Del. quantity cm³/ : 22.8...23.0
 100 s: (22.5...23.3)
 Spread cm³ : 0.6
 100 s: (0.9)

2nd speed rpm : 300.0
 Rack travel in mm : 5.2...5.8
 Del. quantity cm³/ : 1.0...1.6
 100 s: (0.7...1.9)
 Spread cm³ : 0.6
 100 s: (1.0)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
 travel mm : 1.10...1.50
 2nd speed rpm : 567
 travel mm : 4.40...5.00
 3rd speed rpm : 780
 travel mm : 6.00...6.60
 4th speed rpm : 1010
 travel mm : 8.50...8.70
 5th speed rpm : 1190
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1050
 Rack travel in mm : 10.70...13.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 600
Aneroid pressure h: 1200
Del.quantity : 228.0...230.0
1000 : (225.0...233.0)
Spread cm³ : 6.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 117...125

Testing:
1st rack travel in: 12.00
Speed rpm : 990...1000
2nd rack travel in: 4.00
Speed rpm : 1065...1095
4th rack travel in: 1350
Speed rpm : 0.00...1.50

LOW IDLE 1
Control lever
position degrees: 82...90

Testing:
Speed rpm : 200
Minimum rack travel: 9.00
Speed rpm : 300
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION
Speed rpm : 300...390

TORQUE CONTROL
Dimension a mm : 0.50
Torque control curve - 1st version
1st speed rpm : 600
Rack travel in m: 13.40...13.60
2nd speed rpm : 950
Rack travel in m: 12.90...13.10
3rd speed rpm : 850
Rack travel in m: 13.10...13.30

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.40...10.70

Measurement
Speed 1/min : 500

1st pressure hPa : 350

F21

Rack travel in m: 11.10...11.20
2nd pressure hPa : 750
Rack travel in m: 12.80...13.00

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 950
Del.quantity cm³/ : 214.0...218.0
1000 s: (211.0...221.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 134.0...136.0
1000 s: (131.0...139.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.00
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 275.0...295.0
1000 s: (271.0...299.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 30.10.92
 Replaces : 09.92
 Test oil : ISO-4113
 Combination no. : 0 402 648 945
 Injection pump
 Pump designation : PE8P120A320LS7847
 EP type number : 0 412 628 863
 Governor
 Governor design. : RQ300/1050PA1030-6
 Governor no. : 0 421 801 666

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kW : 280.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60
 : (5.45...5.65)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 550

Rack travel in mm : 13.00...13.10

Del.quantity cm³/ : 22.5...22.7

100 s: (22.2...23.0)

Spread cm³ : 0.6

100 s: (0.9)

2nd speed rpm : 300.0
 Rack travel in mm : 4.9...5.5
 Del.quantity cm³/ : 1.0...1.6
 100 s: (0.7...1.9)

Spread cm³ : 0.6
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -2
 Speed rpm : 600
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 550
 Aneroid pressure h: 1200
 Del.quantity : 225.0...227.0
 1000 : (222.0...230.0)
 Spread cm³ : 6.00
 1000 : (9.00)

RATED SPEED

1st version
 Setting point:
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.60
Speed rpm : 1090...1105
2nd rack travel in: 4.00
Speed rpm : 1170...1200
4th rack travel in: 13.00
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.2

Testing:

Speed rpm : 200
Minimum rack travel: 7.30
Speed rpm : 300
Rack travel in mm : 5.10...5.30
Rack travel in mm : 2.00
Speed rpm : 355...395

TORQUE CONTROL

Dimension a mm : 0.30
Torque control curve - 1st version
1st speed rpm : 550
Rack travel in m: 13.00...13.10
2nd speed rpm : 1050
Rack travel in m: 12.60...12.80

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.10...10.40

Measurement

Speed 1/min : 500
1st pressure hPa : 350
Rack travel in m: 10.70...10.80
2nd pressure hPa : 700
Rack travel in m: 12.20...12.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 1050
Del.quantity cm³/ : 210.0...214.0
1000 s: (207.0...217.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm³/ : 134.0...136.0
1000 s: (131.0...139.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.60
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 45.0...75.0
1000 s: (41.0...79.0)
Rack travel in mm : 10.10...10.50

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : 09.92
 Test oil : ISO-4113
 Combination no. : 0 402 648 946
 Injection pump
 Pump designation : PE8P120A320LS7847
 EP type number : 0 412 628 863
 Governor
 Governor design. : RQ300/1050PA1031-7
 Governor no. : 0 421 801 667

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kW : 280.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60
 : (5.45...5.65)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

EASIC SETTING

1st speed rpm : 550

Rack travel in mm : 13.00...13.10

Del.quantity cm³/ : 22.5...22.7

100 s : (22.2...23.0)

Spread cm³ : 0.6

100 s : (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.9...5.5

Del.quantity cm³/ : 1.0...1.6

100 s : (0.7...1.9)

Spread cm³ : 0.6

100 s : (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 550

Aneroid pressure h: 1200

Del.quantity : 225.0...227.0

1000 : (222.0...230.0)

Spread cm³ : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.70
Speed rpm : 1090...1105
2nd rack travel in: 4.00
Speed rpm : 1175...1205
4th rack travel in: 13.00
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.2

Testing:

Speed rpm : 200
Minimum rack travel: 7.40
Speed rpm : 300
Rack travel in mm : 5.10...5.30
Rack travel in mm : 2.00
Speed rpm : 365...405

TORQUE CONTROL

Dimension a mm : 0.30
Torque control curve - 1st version
1st speed rpm : 550
Rack travel in m: 13.00...13.10
2nd speed rpm : 1050
Rack travel in m: 12.60...12.80

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.10...10.40

Measurement

Speed 1/min : 500
1st pressure hPa : 350
Rack travel in m: 10.70...10.80
2nd pressure hPa : 700
Rack travel in m: 12.30...12.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 1050

Del.quantity cm³/ : 210.0...214.0
1000 s: (207.0...217.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 134.0...136.0
1000 s: (131.0...139.0)
Spread cm³ : 8.00
1000 s: (12.0)

EREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 11.70
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 275.0...295.0
1000 s: (271.0...299.0)

Remarks:

APPLICATION

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : 09.92
 Test oil : ISO-4113

Combination no. : 0 402 648 947

Injection pump
 Pump designation : PE8P120A320LS7859
 EP type number : 0 412 628 869
 Governor
 Governor design. : RQ300/950PA1032-5
 Governor no. : 0 421 801 668

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kw : 320.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 550

Rack travel in mm : 13.60...13.70

Del. quantity cm³/ : 24.1...24.3
 100 s: (23.8...24.6)

Spread cm³ : 0.6
 100 s: (0.9)

2nd speed rpm : 300.0
 Rack travel in mm : 4.9...5.5
 Del. quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)

Spread cm³ : 0.6
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 550
 Aneroid pressure h: 1000
 Del. quantity : 241.0...243.0
 1000 : (238.0...246.0)

Spread cm³ : 6.00
 1000 : (9.00)

RATED SPEED

1st version
 Setting point:
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.60
Speed rpm : 990...1005
2nd rack travel in: 4.00
Speed rpm : 1065...1095
4th rack travel in: 1200
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.2

Testing:

Speed rpm : 200
Minimum rack travel: 8.00
Speed rpm : 300
Rack travel in mm : 5.10...5.30
Rack travel in mm : 2.00
Speed rpm : 360...400

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.40...9.70

Measurement

Speed 1/min : 500

1st pressure hPa : 250
Rack travel in m: 10.30...10.40
2nd pressure hPa : 550
Rack travel in m: 12.30...12.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 950
Del.quantity cm³/ : 230.0...234.0
1000 s: (227.0...237.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 132.0...134.0
1000 s: (129.0...137.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

F27

1st version

1mm rack travel less than

full load rack tr: 12.60
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 65.0...95.0
1000 s: (61.0...99.0)
Rack travel in mm : 9.40...9.80

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : 09.92
 Test oil : ISO-4113

Combination no. : 0 402 648 948

Injection pump
 Pump designation : PE8P120A320LS7859
 EP type number : 0 412 628 869
 Governor
 Governor design. : RQ300/1050PA1030-7
 Governor no. : 0 421 801 669

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 320.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...40

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 550

Rack travel in mm : 13.60...13.70

Del. quantity cm³/ : 24.1...24.3
 100 s: (23.8...24.6)

Spread cm³ : 0.6
 100 s: (0.9)

2nd speed rpm : 300.0
 Rack travel in mm : 4.9...5.5
 Del. quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)
 Spread cm³ : 0.6
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -2
 Speed rpm : 600
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 550
 Aneroid pressure h: 1000
 Del. quantity : 241.0...243.0
 1000 : (238.0...246.0)
 Spread cm³ : 6.00
 1000 : (9.00)

RATED SPEED

1st version
 Setting point:
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.40
Speed rpm : 1090...1105
2nd rack travel in: 4.00
Speed rpm : 1170...1200
4th rack travel in: 1300
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.2

Testing:

Speed rpm : 200
Minimum rack travel: 8.00
Speed rpm : 300
Rack travel in mm : 5.10...5.30
Rack travel in mm : 2.00
Speed rpm : 360...400

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 550
Rack travel in m: 14.30...14.50
2nd speed rpm : 1050
Rack travel in m: 13.30...13.50

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.40...9.70

Measurement

Speed 1/min : 500
1st pressure hPa : 250
Rack travel in m: 10.30...10.40
2nd pressure hPa : 550
Rack travel in m: 12.30...12.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 1050
Del.quantity cm3/ : 222.0...226.0
1000 s: (219.0...229.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -

GO1

Speed rpm : 500
Del.quantity cm3/ : 132.0...134.0
1000 s: (129.0...137.0)
Spread cm3 : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 12.40
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 65.0...95.0
1000 s: (61.0...99.0)
Rack travel in mm : 9.40...9.80

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 648 950
 Injection pump
 Pump designation : PE8P120A320LS7860
 EP type number : 0 412 628 870
 Governor
 Governor design. : RQV300...1050PA1052
 Governor no. : 0 421 814 037

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kw : 280.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness : 8.00X2.50X1000
 x Length mm

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60
 : (5.45...5.65)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.40...13.50

Del. quantity cm³/ : 23.3...23.5

100 s : (23.0...23.8)

Spread cm³ : 0.6

100 s : (0.9)

2nd speed rpm : 350.0
 Rack travel in mm : 5.1...5.7
 Del. quantity cm³/ : 1.0...1.6
 100 s : (0.7...1.9)
 Spread cm³ : 0.6
 100 s : (1.0)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350
 travel mm : 1.00...1.50
 2nd speed rpm : 403
 travel mm : 1.70...2.20
 3rd speed rpm : 453
 travel mm : 2.30...2.80
 4th speed rpm : 770
 travel mm : 4.70...5.20
 5th speed rpm : 1108
 travel mm : 9.40...9.90

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1175
 Rack travel in mm : 10.60...13.20

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700

Aneroid pressure h: 1200
Del. quantity : 233.0...235.0
1000 : (230.0...238.0)
Spread cm3 : 6.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 99...107

Testing:
1st rack travel in: 11.90
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1145...1175
4th rack travel in: 1350
Speed rpm : 0.00...1.50

LOW IDLE 1
Control lever
position degrees: 65...73

Testing:
Speed rpm : 250
Minimum rack travel: 9.00
Speed rpm : 350
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION
Speed rpm : 380...500

TORQUE CONTROL
Dimension a mm : 0.60
Torque control curve - 1st version
1st speed rpm : 700
Rack travel in m: 13.40...13.50
2nd speed rpm : 1050
Rack travel in m: 12.80...13.00
3rd speed rpm : 900
Rack travel in m: 13.10...13.30

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.40...10.70

Measurement
Speed 1/min : 500

1st pressure hPa : 350
Rack travel in m: 11.00...11.10
2nd pressure hPa : 750
Rack travel in m: 12.70...12.90

G03

START CUT-OUT

Speed 1/min : 270 (280)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 1050
Del. quantity cm3/ : 206.0...210.0
1000 s: (203.0...213.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del. quantity cm3/ : 134.0...136.0
1000 s: (131.0...139.0)
Spread cm3 : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.90
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm3/ : 240.0...260.0
1000 s: (236.0...264.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 648 951
 Injection pump
 Pump designation : PE8P120A320LS7840-1
 EP type number : 0 412 628 862
 Governor
 Governor design. : RQV300...1050PA1053
 Governor no. : 0 421 814 038

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 250.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 : 4- 1

Phasing : 0-45-90-135-180-225-
 : 270-315
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 700
 Rack travel in mm : 13.30...13.40
 Del. quantity cm³/ : 20.9...21.1
 100 s : (20.6...21.4)
 Spread cm³ : 0.6
 100 s : (0.9)

2nd speed rpm : 350.0
 Rack travel in mm : 5.9...6.5
 Del. quantity cm³/ : 1.6...2.2
 100 s : (1.3...2.5)
 Spread cm³ : 0.8
 100 s : (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350
 travel mm : 1.00...1.50
 2nd speed rpm : 453
 travel mm : 2.30...2.80
 3rd speed rpm : 770
 travel mm : 4.70...5.20
 4th speed rpm : 1108
 travel mm : 9.40...9.90

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1180
 Rack travel in mm : 10.40...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700
 Aneroid pressure h: 1200

Del. quantity : 209.0...211.0
1000 : (206.0...214.0)
Spread cm3 : 6.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 79...87

Testing:
1st rack travel in: 11.60
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1135...1165
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 79...87

Testing:
Speed rpm : 250
Minimum rack travel: 9.90
Speed rpm : 350
Rack travel in mm : 6.10...6.30

CONSTANT REGULATION
Speed rpm : 380...550

TORQUE CONTROL
Dimension a mm : 0.70
Torque control curve - 1st version
1st speed rpm : 700
Rack travel in m: 13.30...13.40
2nd speed rpm : 1030
Rack travel in m: 12.60...12.80
3rd speed rpm : 825
Rack travel in m: 13.10...13.20

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 11.00...11.30

Measurement
Speed 1/min : 500

1st pressure hPa : 350
Rack travel in m: 11.30...11.40
2nd pressure hPa : 700
Rack travel in m: 12.60...12.80

START CUT-OUT

Speed 1/min : 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 1030
Del. quantity cm3/ : 192.0...196.0
1000 s: (189.0...199.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del. quantity cm3/ : 136.0...138.0
1000 s: (133.0...141.0)
Spread cm3 : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.60
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm3/ : 200.0...220.0
1000 s: (196.0...224.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 402 648 952

Injection pump
 Pump designation : PE8P120A320LS7856
 EP type number : 0 412 628 867
 Governor
 Governor design. : RQV350...1050PA1051
 -1

Governer no. : 0 421 814 039

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 320.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

G06

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 Phasing : 270-315
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600

 Rack travel in mm : 14.00...14.10

 Del. quantity cm³/ : 23.8...24.0
 100 s: (23.5...24.3)

 Spread cm³ : 0.6

 100 s: (0.9)

2nd speed rpm : 350.0
 Rack travel in mm : 5.9...6.5
 Del. quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)
 Spread cm³ : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350
 travel mm : 1.00...1.50
 2nd speed rpm : 453
 travel mm : 2.30...2.80
 3rd speed rpm : 770
 travel mm : 4.70...5.20
 4th speed rpm : 1108
 travel mm : 9.40...9.90

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1170
 Rack travel in mm : 11.50...14.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 600
 Aneroid pressure h: 1000

Del. quantity : 238.0...240.0
1000 : (235.0...243.0)
Spread cm³ : 6.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 99...107

Testing:

1st rack travel in: 12.80
Speed rpm : 1080...1090
2nd rack travel in: 4.00
Speed rpm : 1145...1175
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 65...73

Testing:

Speed rpm : 250
Minimum rack travel: 9.40
Speed rpm : 350
Rack travel in mm : 6.10...6.30

CONSTANT REGULATION

Speed rpm : 350...450

TORQUE CONTROL

Dimension a mm : 0.20
Torque control curve - 1st version
1st speed rpm : 600
Rack travel in m: 14.00...14.10
2nd speed rpm : 1050
Rack travel in m: 13.80...14.00
3rd speed rpm : 960
Rack travel in m: 13.80...13.90

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.60...10.90

Measurement

Speed 1/min : 500

1st pressure hPa : 250
Rack travel in m: 10.90...11.00
2nd pressure hPa : 600
Rack travel in m: 12.90...13.10

START CUT-OUT

Speed 1/min : 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 1050
Del. quantity cm³/ : 222.0...226.0
1000 s: (219.0...229.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del. quantity cm³/ : 142.0...144.0
1000 s: (139.0...147.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 12.80
Speed rpm : 1080...1090

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 240.0...260.0
1000 s: (236.0...264.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : -
 Test oil : ISO-4113

 Combination no. : 0 402 648 953

 Injection pump
 Pump designation : PE8P12JA320LS7859
 EP type number : 0 412 628 869
 Governor
 Governor design. : RQV300...950PA1033
 -10
 Governor no. : 0 421 814 040

 Customer-spec. information
 Customer : MERCEDES-BENZ

 Engine : OM442 LA

 1st version kW : 320.0
 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

 Overflow valve
 : 1 417 413 025

 Inlet press., bar : 1.50

 Overflow
 quantity min. 1/h: 100...120

 Test nozzle holder
 assembly : 1 688 901 105

 Opening
 pressure, bar : 207...210

 Orifice plate
 diameter mm : 0,8

 Test lines : 1 680 750 075

 Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

 Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

 Phasing : 0-45-90-135-180-225-
 270-315
 Tolerance + - ° : 0.50 (0.75)

 Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 550

 Rack travel in mm : 13.60...13.70

 Del.quantity cm³/ : 24.1...24.3

 100 s: (23.8...24.6)

 Spread cm³ : 0.6

 100 s: (0.9)

 2nd speed rpm : 300.0
 Rack travel in mm : 4.9...5.5
 Del.quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)
 Spread cm³ : 0.6
 100 s: (1.0)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
 travel mm : 1.00...1.50
 2nd speed rpm : 567
 travel mm : 4.40...4.90
 3rd speed rpm : 617
 travel mm : 5.00...5.50
 4th speed rpm : 780
 travel mm : 6.10...6.60
 5th speed rpm : 1009
 travel mm : 8.30...8.80

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1050
 Rack travel in mm : 11.30...13.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 550
Aneroid pressure h: 1000
Del.quantity : 241.0...243.0
1000 : (238.0...246.0)
Spread cm³ : 6.00
1000 : (9.00)

RATED SPEED

1st version

Control lever
position degrees: 117...125

Testing:

1st rack travel in: 12.60
Speed rpm : 990...1000
2nd rack travel in: 4.00
Speed rpm : 1065...1095
4th rack travel in: 1200
Speed rpm : 0.00...1.50

LOW IDLE 1

Control lever
position degrees: 82...90

Testing:

Speed rpm : 200
Minimum rack travel: 8.80
Speed rpm : 300
Rack travel in mm : 5.10...5.30
Rack travel in mm : 2.00
Speed rpm : 380...420

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.40...9.70

Measurement

Speed 1/min : 500

1st pressure hPa : 250
Rack travel in m: 10.30...10.40
2nd pressure hPa : 550
Rack travel in m: 12.30...12.50

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 950
Del.quantity cm³/ : 230.0...234.0
1000 s: (227.0...237.0)
Spread cm³ : 8.00
1000 s: (12.0)

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 132.0...134.0
1000 s: (129.0...137.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 12.60
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100
Rack travel in mm : 9.40...9.80

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 03.12.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 648 954
 Injection pump
 Pump designation : PE8P120A320LS7859
 EP type number : 0 412 628 869
 Governor
 Governor design. : RQ300/1050PA1031-8
 Governor no. : 0 421 801 674

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 320.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 550
 Rack travel in mm : 13.60...13.70
 Del. quantity cm³/ : 24.1...24.3
 100 s: (23.8...24.6)

Spread cm³ : 0.6
 100 s: (0.9)

2nd speed rpm : 300.0
 Rack travel in mm : 4.9...5.5
 Del. quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)
 Spread cm³ : 0.6
 100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -2
 Speed rpm : 600
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 550
 Aneroid pressure h: 1000
 Del. quantity : 241.0...243.0
 1000 : (238.0...246.0)
 Spread cm³ : 6.00
 1000 : (9.00)

RATED SPEED

1st version
 Setting point:
 Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.40
Speed rpm : 1090...1105
2nd rack travel in: 4.00
Speed rpm : 1165...1195
4th rack travel in: 13.00
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.2

Testing:

Speed rpm : 200
Minimum rack travel: 7.40
Speed rpm : 300
Rack travel in mm : 5.10...5.30
Rack travel in mm : 2.00
Speed rpm : 370...410

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 550
Rack travel in m: 14.30...14.50
2nd speed rpm : 1050
Rack travel in m: 13.30...13.50

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.40...9.70

Measurement

Speed 1/min : 500
1st pressure hPa : 250
Rack travel in m: 10.30...10.40
2nd pressure hPa : 550
Rack travel in m: 12.30...12.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 1050
Del. quantity cm³/ : 222.0...226.0
1000 s: (219.0...229.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -

Speed rpm : 500
Del. quantity cm³/ : 132.0...134.0
1000 s: (129.0...137.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 12.40
Speed rpm : 1090...1105

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN
 Edition : 23.10.92
 Replaces : 07.92
 Test oil : ISO-4113

Combination no. : 0 402 649 816

Injection pump
 Pump designation : PE10P120A520LS7853
 EP type number : 0 412 629 810
 Governor
 Governor design. : RQV300...1150PA1039-2K
 Governor no. : 0 421 815 316

Customer-spec. information
 Customer : MAN

Engine : D 2840 LXE

1st version kW : 603.0
 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder assembly : 1 688 901 019

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant. per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60
 : (4.45...4.65)
 Rack travel in mm : 9.00...12.00
 Firing order : 10- 9- 4- 1- 8- 7-
 : 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-
 Phasing : 216-261-288-333
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 13.30...13.40

Del.quantity cm3/ : 29.4...29.6
 100 s : (29.1...29.9)

Spread cm3 : 0.5
 100 s : (0.9)

2nd speed rpm : 700
 Rack travel in mm : 12.10...12.30
 Del.quantity cm3/ : 25.2...25.8
 100 s : (24.9...26.1)

Spread cm3 : 1.0
 100 s : (1.4)

3rd speed rpm : 300
 Rack travel in mm : 6.70...6.90
 Del.quantity cm3/ : 4.0...5.0 **
 100 s : (-)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300
 travel mm : 2.00...2.20

2nd speed rpm : 450
 travel mm : 4.00...4.40

3rd speed rpm : 800
 travel mm : 6.70...7.10

4th speed rpm : 1200
 travel mm : 10.30...10.50

5th speed rpm : 1400
 travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1

Speed rpm : 1280
 Rack travel in mm : 11.20...13.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150
Aneroid pressure h: 1300
Del.quantity : 294.0...296.0
1000 : (291.0...299.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version

Control lever
position degrees: 117...125

Testing:

1st rack travel in: 12.30
Speed rpm : 1195...1210
2nd rack travel in: 4.00
Speed rpm : 1310...1340
4th rack travel in: 1450
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 72...80

Testing:

Speed rpm : 200
Minimum rack trave: 8.20
Speed rpm : 300
Rack travel in mm : 6.70...6.90

CONSTANT REGULATION

Speed rpm : 280...410

TORQUE CONTROL

Dimension a mm : 1.20
Torque control curve - 1st version
1st speed rpm : 1150
Rack travel in m: 13.30...13.40
2nd speed rpm : 700
Rack travel in m: 12.10...12.30
3rd speed rpm : 900
Rack travel in m: 12.90...13.10

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 1150
Pressure hPa : 1300
Rack travel mm : 13.30...13.40

Measurement

Speed 1/min : 1150

1st pressure hPa : -
Rack travel in m: 9.90...10.10
2nd pressure hPa : 400
Rack travel in m: 10.30...10.40
3rd pressure hPa : 850
Rack travel in m: 12.40...12.70

START CUT-OUT

Speed 1/min : 240 (260)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1300
Speed rpm : 700
Del.quantity cm³/ : 252.0...258.0
1000 s: (249.0...261.0)
Spread cm³ : 10.00
1000 s: (14.0)
Aneroid pressure in: 1300
Speed rpm : 900
Del.quantity cm³/ : 277.0...283.0
1000 s: (274.0...286.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 169.0...171.0
1000 s: (166.0...174.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 12.30
Speed rpm : 1195...1210

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 100.0...120.0**
1000 s: (-)

Speed rpm : 100
Del.quantity cm³/ : 0 *
1000 s: (-)
Rack travel in mm : 18.2...21.0

HIGH IDLE

1st version

Speed rpm : 500
Rack travel in mm : 0.00...7.00
Del.quantity cm³/ : 0 *
1000 s: (-)

2nd version

Speed rpm : 500
Rack travel in mm : 0.00...7.50
Del.quantity cm³/ : 0...50.0 *
1000 s: (-)

3rd version

Speed rpm : 500
Rack travel in mm : 8.50...8.70
Del.quantity cm³/ : 125.0...
1000 s: (-)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.70...6.90
Del.quantity cm³/ : 40.0...50.0
1000 s: (-)

Remarks:

* applies to cylinders 1, 2, 3, 7 and 9
** applies for cylinders 4, 5, 6, 8 and 10

APPLICATION

Ship

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 649 817
 Injection pump
 Pump designation : PE10P120A320LS7862
 EP type number : 0 412 629 811
 Governor
 Governor design. : RQV350...1050PA1048
 Governor no. : 0 421 814 031

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM443 LA

1st version kW : 412.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder assembly : 1 688 901 105

Opening pressure, bar : 207...210

Orifice plate diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 10- 9- 4- 1- 8- 7
 - 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-
 216-261-288-333
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 13.80...13.90

Del.quantity cm3/ : 23.0...23.2

100 s: (22.7...23.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0
 Rack travel in mm : 4.9...5.5
 Del.quantity cm3/ : 1.6...2.2
 100 s: (1.3...2.5)
 Spread cm3 : 0.6
 100 s: (1.0)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350
 travel mm : 1.30...1.80
 2nd speed rpm : 404
 travel mm : 2.25...2.75
 3rd speed rpm : 570
 travel mm : 3.30...3.80
 4th speed rpm : 900
 travel mm : 5.40...5.90
 5th speed rpm : 1107
 travel mm : 7.80...8.30

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1145
 Rack travel in mm : 12.20...14.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1050

Aneroid pressure h: 1300
Del.quantity : 230.0...232.0
1000 : (227.0...235.0)
Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 117...125

Testing:
1st rack travel in: 12.80
Speed rpm : 1090...1100
2nd rack travel in: 4.00
Speed rpm : 1160...1190
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 65...73

Testing:
Speed rpm : 250
Minimum rack travel: 7.60
Speed rpm : 350
Rack travel in mm : 5.10...5.30

CONSTANT REGULATION
Speed rpm : 350...450

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.10...10.40

Measurement
Speed 1/min : 500

1st pressure hPa : 400
Rack travel in m: 10.90...11.00
2nd pressure hPa : 600
Rack travel in m: 12.30...12.40

START CUT-OUT

Speed 1/min : 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1300

Speed rpm : 800
Del.quantity cm³/ : 228.0...232.0
1000 s: (225.0...235.0)
Spread cm³ : 8.00
1000 s: (12.0)

Aneroid pressure h: 1300
Speed rpm : 1050
Del.quantity cm³/ : 168.0...170.0 *
1000 s: (165.0...173.0)
Spread cm³ : 8.00
1000 s: (12.0)

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 136.0...138.0
1000 s: (133.0...141.0)
Spread cm³ : 8.00
1000 s: (-)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.80
Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 250.0...270.0
1000 s: (246.0...274.0)

Remarks:

* = Set at reduced-delivery stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 670 800
 Injection pump
 Pump designation : PE12P120A320LS7850
 EP type number : 0 412 620 833
 Governor
 Governor design. : RSV350...750POA825
 Governor no. : 0 421 833 221

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kW : 389.0
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 150...170

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter
 x Wall thickness : 6.00X1.50X1000
 x Length mm

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 9.00...12.00
 Firing order : 12- 1- 5- 9- 8- 3-
 4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-
 180-225-240-285-300-
 345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.10...13.20

Del.quantity cm³/ : 21.0...21.2

100 s: (20.7...21.5)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 4.6...4.8

Del.quantity cm³/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm³ : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 210.0...212.0

1000 : (207.0...215.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever
position degrees: 21...29

Testing:

1st rack travel in: 12.10
Speed rpm : 750...755
2nd rack travel in: 4.00
Speed rpm : 780...790
4th rack travel in: 1000
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 9...17
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 4.7

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 350
Rack travel in mm : 4.60...4.80

SET IDLE AUXILIARY SPRING
Rack travel in mm : 2.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 650
Del.quantity cm³/ : 209.0...213.0
1000 s: (206.0...216.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 12.10
Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 210.0...230.0
1000 s: (206.0...234.0)

Remarks:

:

Observe VDT-I-420/120

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 676 814
 Injection pump
 Pump designation : PE6P120A320LS7861
 EP type number : 0 412 626 876
 Governor
 Governor design. : RSV350...1050POA535
 -7
 Governor no. : 0 421 833 386

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM 401 LA

1st version kW : 213.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness : 8.00X2.50X1000
 x Length mm

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 6-3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 12.60...12.70

Del.quantity cm³/ : 20.5...20.7

100 s: (20.2...21.0)

Spread cm³ : 0.6

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 4.8...5.4

Del.quantity cm³/ : 1.0...1.6

100 s: (0.7...1.9)

Spread cm³ : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1030

Aneroid pressure h: 1200

Del.quantity : 205.0...207.0

1000 : (202.0...210.0)

Spread cm³ : 6.00

1000 : (9.00)

RATED SPEED

1st version

Control lever
position degrees: 95...103

Testing:
1st rack travel in: 11.40
Speed rpm : 1070...1080
2nd rack travel in: 4.00
Speed rpm : 1145...1163
4th rack travel in: 1300
Speed rpm : 0.30...1.40

LOW IDLE 1
Control lever
position degrees: 72...80
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.1

Testing:
Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 350
Rack travel in mm : 4.80...5.40
Rack travel in mm : 2.00
Speed rpm : 370...430

SET IDLE AUXILIARY SPRING
Rack travel in mm : 2.00

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.20...10.50

Measurement
Speed 1/min : 500

1st pressure hPa : 350
Rack travel in m: 10.90...11.00
2nd pressure hPa : 450
Rack travel in m: 11.40...11.60

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 800
Del.quantity cm³/ : 202.0...206.0
1000 s: (199.0...209.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500

Del.quantity cm³/ : 130.0...132.0
1000 s: (127.0...135.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.40
Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 230.0...250.0
1000 s: (226.0...254.0)

Remarks:

Observe VDT-I-420/120

APPLICATION

Sweeping machine

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 30.10.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 676 815
 Injection pump
 Pump designation : PE6P120A320LS7808-3
 EP type number : 0 412 626 870
 Governor
 Governor design. : RSV500...900POA535-8
 Governor no. : 0 421 833 387

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM 441 LA

1st version kW : 236.0
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Overflow
 quantity min. 1/h: 100...120
 Test nozzle holder
 assembly : 1 688 901 105
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,8
 Test Lines : 1 680 750 075
 Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 3- 5- 2- 4- 1
 Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 880
 Rack travel in mm : 14.70...14.80
 Del.quantity cm³/ : 23.3...23.5
 100 s : (23.0...23.8)
 Spread cm³ : 0.6
 100 s : (0.9)
 2nd speed rpm : 500.0
 Rack travel in mm : 4.3...4.9
 Del.quantity cm³/ : 1.6...2.2
 100 s : (1.3...2.5)
 Spread cm³ : 0.8
 100 s : (1.2)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 880
 Aneroid pressure h: 1200
 Del.quantity : 233.0...235.0
 1000 : (230.0...238.0)
 Spread cm³ : 6.00
 1000 : (9.00)

RATED SPEED

1st version

Control lever
position degrees: 81...89

Testing:

1st rack travel in: 13.70
Speed rpm : 930...940
2nd rack travel in: 4.00
Speed rpm : 970...988
4th rack travel in: 1300
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 65...73
Setting point w/out bumper spring
Speed rpm : 500
Rack travel in mm : 4.6

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 500
Rack travel in mm : 4.30...4.90
Rack travel in mm : 2.00
Speed rpm : 500...560

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.60...9.90

Measurement

Speed 1/min : 500

1st pressure hPa : 400
Rack travel in m: 11.20...11.30
2nd pressure hPa : 600
Rack travel in m: 12.80...13.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 700
Del.quantity cm³/ : 232.0...236.0
1000 s: (229.0...239.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500

Del.quantity cm³/ : 145.0...147.0
1000 s: (142.0...150.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 13.70
Speed rpm : 930...940

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 240.0...260.0
1000 s: (236.0...264.0)

Remarks:

: ATLAS-COPCO

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 23.10.92
 Replaces : 08.92
 Test oil : ISO-4113
 Combination no. : 0 402 678 816
 Injection pump
 Pump designation : PE8P120A320LS7857
 EP type number : 0 412 628 866
 Governor
 Governor design. : RSV550...1050POA826
 -3
 Governor no. : 0 421 833 382

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM442LA

1st version kw : 370.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10
 : (4.95...5.15)
 Rack travel in mm : 19.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 1080

Rack travel in mm : 13.50...13.60

Del.quantity cm³/ : 25.9...26.1

100 s: (25.6...26.4)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 550.0

Rack travel in mm : 3.5...4.1

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1080

Del.quantity : 259.0...261.0

1000 : (256.0...264.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever
position degrees: 86...94

Testing:

1st rack travel in: 12.50
Speed rpm : 1110...1120
2nd rack travel in: 4.00
Speed rpm : 1140...1158
4th rack travel in: 1500
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 66...74
Setting point w/out bumper spring
Speed rpm : 550
Rack travel in mm : 3.8

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 550
Rack travel in mm : 3.70...3.90
Rack travel in mm : 2.00
Speed rpm : 550...610

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1080
Rack travel in m: 13.50...13.60
2nd speed rpm : 1000
Rack travel in m: 13.60...13.80
3rd speed rpm : 600
Rack travel in m: 14.00...14.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600
Del. quantity cm³/ : 290.0...294.0
1000 s: (287.0...297.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 12.50
Speed rpm : 1110...1120

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 325.0...345.0
1000 s: (321.0...349.0)

Remarks:

In order to adjust and test the EP combination, set full-load speed regul. at 1110...1120 1/min. Then set speed regul. to 1060...1070 1/min again.

APPLICATION

Forage harvester

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : --
 Test oil : ISO-4113
 Combination no. : 0 402 678 819
 Injection pump
 Pump designation : PE8P120A32QLS7860
 EP type number : 0 412 628 870
 Governor
 Governor design. : RSV550...1050POA826
 -5
 Governor no. : 0 421 833 390
 Customer-spec. information
 Customer : MERCEDES-BENZ
 Engine : OM402LA
 1st version kW : 280.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Overflow
 quantity min. 1/h: 110...130
 Test nozzle holder
 assembly : 1 688 901 105
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,8
 Test lines : 1 680 750 075
 Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X1000
 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 5.50...5.60
 : (5.45...5.65)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1
 Phasing : 0-45-90-135-180-225-
 270-315
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 1050
 Rack travel in mm : 12.20...12.30
 Del.quantity cm3/ : 20.7...20.9
 100 s: (20.4...21.2)
 Spread cm3 : 0.5
 100 s: (0.9)
 2nd speed rpm : 550.0
 Rack travel in mm : 3.3...3.9
 Del.quantity cm3/ : 1.5...2.1
 100 s: (1.2...2.4)
 Spread cm3 : 0.8
 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...0.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1050
 Del.quantity : 207.0...209.0
 1000 : (204.0...212.0)
 Spread cm3 : 5.00
 1000 : (9.00)

RATED SPEED

1st version
 Control lever
 position degrees: 87...95

Testing:

1st rack travel in: 11.20
Speed rpm : 1110...1120
2nd rack travel in: 4.00
Speed rpm : 1140...1158
4th rack travel in: 1300
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 68...76
Setting point w/out bumper spring
Speed rpm : 550
Rack travel in mm : 3.6

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 550
Rack travel in mm : 3.50...3.70
Rack travel in mm : 2.00
Speed rpm : 540...600

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 12.20...12.30
2nd speed rpm : 700
Rack travel in m: 12.80...13.00
3rd speed rpm : 900
Rack travel in m: 12.50...12.70

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700
Del. quantity cm3/ : 232.0...236.0
1000 s: (229.0...239.0)
Spread cm3 : 8.00
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 11.20
Speed rpm : 1110...1120

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm3/ : 240.0...260.0
1000 s: (236.0...264.0)

Remarks:

In order to adjust and test the EP combination, set full-load speed regul. at 1110...1120 1/min. Then set speed regul. to 1060...1070 1/min again.

APPLICATION

Forage harvester

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 23.10.92
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 402 678 820

Injection pump
 Pump designation : PE8P120A320LS7823-1
 EP type number : 0 412 628 872
 Governor
 Governor design. : RSV350...1050POA535
 -9
 Governor no. : 0 421 833 393

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM442LA

1st version kW : 362.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 019

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness : 8.00X2.50X1000
 x Length mm

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 9.00...12.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.70...13.80

Del. quantity cm³/ : 23.4...23.7

100 s: (23.1...24.0)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.4...6.0

Del. quantity cm³/ : 1.5...2.1

100 s: (1.2...2.4)

Spread cm³ : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del. quantity : 234.0...237.0

1000 : (231.0...240.0)

Spread cm³ : 5.0

1000 : (9.0)

RATED SPEED

1st version
Control lever
position degrees: ?

Testing:

1st rack travel in: 13.50
Speed rpm : 1070...1080
2nd rack travel in: 4.00
Speed rpm : 1135...1153
4th rack travel in: 1400
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 63...71
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.7

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 350
Rack travel in mm : 5.60...5.80
Rack travel in mm : 2.00
Speed rpm : 360...420

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1030
Rack travel in m: 14.50...14.70
2nd speed rpm : 950
Rack travel in m: 14.80...15.00
3rd speed rpm : 700
Rack travel in m: 15.40...15.50

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 600
Pressure hPa : 900
Rack travel mm : 13.70...13.80

Measurement

Speed 1/min : 600

1st pressure hPa : 350
Rack travel in m: 11.20...11.40
2nd pressure hPa : 1050
Rack travel in m: 13.80...14.00 *
3rd pressure hPa : -
Rack travel in m: 9.70...10.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1600
Speed rpm : 1030
Del. quantity cm³/ : 253.0...256.0
1000 s: (250.0...259.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: 1600
Speed rpm : 800
Del. quantity cm³/ : 271.0...274.0
1000 s: (268.0...277.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del. quantity cm³/ : 141.0...143.0
1000 s: (138.0...146.0)
Spread cm³ : 8.00
1000 s: (-)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.50
Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 240.0...260.0
1000 s: (236.0...264.0)

Remarks:

* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 23.10.92
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 402 678 821

Injection pump
 Pump designation : PE8P120A320LS7860-1
 EP type number : 0 412 628 871
 Governor
 Governor design. : RSV350...1050POA535
 -11

Governer no. : 0 421 833 391

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM 402 LA

1st version kw : 280.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

H01

Prestroke mm : 5.50...5.60
 : (5.45...5.65)
 Rack travel in mm : 20.00...21.00
 Firing order : 8- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 Phasing : 270-315
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 12.80...12.90

Del.quantity cm³/ : 20.6...20.8

100 s : (20.3...21.1)

Spread cm³ : 0.6

100 s : (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.1...5.7

Del.quantity cm³/ : 1.0...1.6

100 s : (0.7...1.9)

Spread cm³ : 0.8

100 s : (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1030

Aneroid pressure h: 1200

Del.quantity : 206.0...208.0

1000 : (203.0...211.0)

Spread cm³ : 6.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 95...103

Testing:

1st rack travel in: 11.90

Speed rpm : 1070...1080
2nd rack travel in: 4.00
Speed rpm : 1150...1168
4th rack travel in: 1300
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 72...80
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.4

Testing:

Speed rpm : 100
Minimum rack travel: 19.50
Speed rpm : 350
Rack travel in mm : 5.10...5.70
Rack travel in mm : 2.00
Speed rpm : 350...410

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1030
Rack travel in m: 12.80...12.90
2nd speed rpm : 900
Rack travel in m: 13.10...13.30
3rd speed rpm : 700
Rack travel in m: 13.30...13.50

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.50...10.70

Measurement

Speed 1/min : 500
1st pressure hPa : 350
Rack travel in m: 11.20...11.30
2nd pressure hPa : 750
Rack travel in m: 12.80...13.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 700
Del.quantity cm³/ : 233.0...235.0
1000 s: (230.0...238.0)

Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 134.0...136.0
1000 s: (131.0...139.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 11.90
Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 200.0...220.0
1000 s: (196.0...224.0)

Remarks:

Observe VDT-I-420/120

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 23.10.92
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 402 678 822

Injection pump
 Pump designation : PE8P120A320LS7840-2
 EP type number : 0 412 628 873
 Governor
 Governor design. : RSV350...105(P0A535
 -10

Governer no. : 0 421 833 395

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM 442 A

1st version kW : 250.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

H03

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 3- 7- 2- 6- 3- 5-
 4- 1

Phasing : 0-45-90-135-180-225-
 Phasing : 270-315
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 12.60...12.70

Del.quantity cm³/ : 19.3...19.5

100 s : (19.0...19.8)

Spread cm³ : 0.6

100 s : (0.9)

2nd speed rpm : 350.0
 Rack travel in mm : 4.8...5.4
 Del.quantity cm³/ : 1.0...1.6
 100 s : (0.7...1.9)
 Spread cm³ : 0.8
 100 s : (1.2)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...0.70

Governor spring pre-tension
 Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1030
 Aneroid pressure h: 1200
 Del.quantity : 193.0...195.0
 1000 : (190.0...198.0)
 Spread cm³ : 6.00
 1000 : (9.00)

RATED SPEED

1st version
 Control lever
 position degrees: 95...103

Testing:

1st rack travel in: 11.70
Speed rpm : 1070...1080
2nd rack travel in: 4.00
Speed rpm : 1150...1168
4th rack travel in: 1300
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 72...80
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.1

Testing:

Speed rpm : 100
Minimum rack trave: 19.50
Speed rpm : 350
Rack travel in mm : 4.80...5.40
Rack travel in mm : 2.00
Speed rpm : 350...410

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1030
Rack travel in m: 12.60...12.70
2nd speed rpm : 900
Rack travel in m: 12.90...13.10
3rd speed rpm : 700
Rack travel in m: 13.30...13.50

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 11.30...11.50

Measurement

Speed 1/min : 500

1st pressure hPa : 350
Rack travel in m: 11.70...11.80
2nd pressure hPa : 700
Rack travel in m: 12.90...13.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 700

H04

Del.quantity cm³/ : 209.0...211.0
1000 s: (206.0...214.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 136.0...138.0
1000 s: (133.0...141.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.70
Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 200.0...220.0
1000 s: (196.0...224.0)

Remarks:

Observe VDT-I-420/120

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 r
 Edition : 08.12.92
 Replaces : 05.92
 Test oil : ISO-4113

Combination no. : 0 402 736 807

Injection pump
 Pump designation : PES6P110A120RS7214
 EP type number : 0 412 716 805
 Governor
 Governor design. : RQV350...1100PA964
 -1K
 Governor no. : 0 421 815 253

Customer-spec. information
 Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 201.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 115...125

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

H05

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45
 : (4.30...4.50)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 15.80...15.90

Del. quantity cm³/ : 20.9...21.1
 100 s: (20.6...21.4)

Spread cm³ : 0.5
 100 s: (0.9)

2nd speed rpm : 350.0
 Rack travel in mm : 5.7...5.9
 Del. quantity cm³/ : 2.7...3.3
 100 s: (2.5...3.5)

Spread cm³ : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350
 travel mm : 1.80...2.00

2nd speed rpm : 450
 travel mm : 3.10...3.50

3rd speed rpm : 600
 travel mm : 5.10...5.50

4th speed rpm : 1000
 travel mm : 8.10...8.30

5th speed rpm : 1200
 travel mm : 9.60...10.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1050
 Aneroid pressure h: 1500
 Del. quantity : 209.0...211.0
 1000 : (206.0...214.0)

Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 64...72

Testing:
1st rack travel in: 14.50
Speed rpm : 1145...1155
2nd rack travel in: 4.00
Speed rpm : 1300...1330
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 11...19

Testing:
Speed rpm : 275
Minimum rack travel: 7.20
Speed rpm : 350
Rack travel in mm : 5.70...5.90

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 15.80...15.90
2nd speed rpm : 650
Rack travel in m: 13.30...13.70
3rd speed rpm : 1100
Rack travel in m: 15.50...15.70

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 1050
Pressure hPa : 1500
Rack travel mm : 15.80...15.90

Measurement

Speed 1/min : 1050
1st pressure hPa : -
Rack travel in m: 8.10...8.50
2nd pressure hPa : 335
Rack travel in m: 10.10...10.20
3rd pressure hPa : 845
Rack travel in m: 13.60...14.00

START CUT-OUT

Speed 1/min : 290 (300)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1500
Speed rpm : 650
Del. quantity cm³/ : 190.5...196.5
1000 s: (187.5...199.5)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del. quantity cm³/ : 91.0...95.0
1000 s: (89.0...97.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 14.50
Speed rpm : 1145...1155

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 135.0...175.0
1000 s: (130.0...180.0)
Rack travel in mm : 11.00...12.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.70...5.90
Del. quantity cm³/ : 27.0...33.0
1000 s: (25.0...35.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

: C.D.C. # 3921771

Start-of-delivery mark = 5.5° after
start of delivery cyl. 1.

Bow dimension:
Sliding-sleeve position = 37.0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 r 2
 Edition : 23.10.92
 Replaces : 05.92
 Test oil : ISO-4113

Combination no. : 0 402 736 816

Injection pump
 Pump designation : PES6P110A120RS7214
 EP type number : 0 412 716 805
 Governor
 Governor design. : RQV350...1200PA964
 -8K
 Governor no. : 0 421 815 264

Customer-spec. information
 Customer : C.D.C.

Engine : 6CTA-A

1st version kw : 213.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 115...125

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45
 : (4.30...4.50)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 14.80...14.90

Del. quantity cm³/ : 19.3...19.5

100 s: (19.0...19.8)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.6...5.8

Del. quantity cm³/ : 2.7...3.3

100 s: (2.5...3.5)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350
 travel mm : 1.80...2.00

2nd speed rpm : 450
 travel mm : 3.10...3.50

3rd speed rpm : 700
 travel mm : 5.90...6.30

4th speed rpm : 1200
 travel mm : 9.00...9.20

5th speed rpm : 1400
 travel mm : 10.70...11.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1100
 Aneroid pressure h: 1200
 Del. quantity : 193.0...195.0
 1000 : (190.0...198.0)

Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 62...70

Testing:
1st rack travel in: 13.30
Speed rpm : 1245...1255
2nd rack travel in: 4.00
Speed rpm : 1400...1430
3rd rack travel in: 4.00
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 11...19

Testing:
Speed rpm : 275
Minimum rack travel: 7.20
Speed rpm : 350
Rack travel in mm : 5.60...5.80

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 14.80...14.90
2nd speed rpm : 650
Rack travel in m: 12.70...13.10
3rd speed rpm : 1200
Rack travel in m: 14.30...14.50

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 1100
Pressure hPa : 1200
Rack travel mm : 14.80...14.90

Measurement
Speed 1/min : 1100

1st pressure hPa : -
Rack travel in m: 7.80...8.20
2nd pressure hPa : 335
Rack travel in m: 9.60...9.70
3rd pressure hPa : 785
Rack travel in m: 12.80...13.20

H08

START CUT-OUT

Speed 1/min : 290 (300)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 650
Del.quantity cm³/ : 185.0...191.0
1000 s: (182.0...194.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 90.0...94.0
1000 s: (88.0...96.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.30
Speed rpm : 1245...1255

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 135.0...175.0
1000 s: (130.0...180.0)
Rack travel in mm : 10.70...11.70

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.60...5.80
Del.quantity cm³/ : 27.0...33.0
1000 s: (25.0...35.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks: : C.D.C. # 3921770

Start-of-delivery mark 6° cam angle
after start of delivery cyl. 1

Bow dimension:
Sliding-sleeve position = 37.0 mm

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.50
Speed rpm : 1095...1110
2nd rack travel in: 4.00
Speed rpm : 1160...1190
4th rack travel in: 12.50
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.2

Testing:

Speed rpm : 200
Minimum rack travel: 7.70
Speed rpm : 300
Rack travel in mm : 6.00...6.40
Rack travel in mm : 2.00
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 13.50...13.70
2nd speed rpm : 750
Rack travel in m: 14.90...15.10

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 600
Pressure hPa : 680
Rack travel mm : 14.10...14.30

Measurement

Speed 1/min : 600
1st pressure hPa : 300
Rack travel in m: 12.40...12.60
2nd pressure hPa : 400
Rack travel in m: 13.10...13.30
3rd pressure hPa : 800
Rack travel in m: 14.20...14.30 *

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

H10

Speed rpm : 1050
Del.quantity cm3/ : 192.0...196.0
1000 s: (189.0...199.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: 1200
Speed rpm : 750
Del.quantity cm3/ : 218.0...222.0
1000 s: (215.0...225.0)
Spread cm3 : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 144.0...146.0
1000 s: (141.0...149.0)
Spread cm3 : 8.00
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 12.50
Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 190.0...210.0
1000 s: (186.0...214.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM
 Edition : 08.12.92
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 402 736 836

Injection pump
 Pump designation : PES6P120A12ORS7265
 EP type number : 0 412 726 882
 Governor
 Governor design. : RQV350...100CPA964
 -14K
 Governor no. : 0 421 815 325

Customer-spec. information
 Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 205.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 083

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 115...125

Test nozzle holder
 assembly : 1 688 901 103

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.95...4.05
 : (3.90...4.10)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 14.50...14.60

Del. quantity cm³/ : 23.6...23.8

100 s: (23.3...24.1)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 6.4...6.6

Del. quantity cm³/ : 2.3...2.9

100 s: (2.1...3.1)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350
 travel mm : 1.80...2.00

2nd speed rpm : 450
 travel mm : 3.10...3.50

3rd speed rpm : 600
 travel mm : 5.10...5.50

4th speed rpm : 1000
 travel mm : 8.10...8.30

5th speed rpm : 1200
 travel mm : 9.60...10.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1000
 Aneroid pressure h: 1200
 Del. quantity : 236.5...238.5
 1000 : (233.5...241.5)

Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 62...70

Testing:
1st rack travel in: 13.30
Speed rpm : 1150...1160
2nd rack travel in: 4.00
Speed rpm : 1295...1325
4th rack travel in: 14.00
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 12...20

Testing:
Speed rpm : 275
Minimum rack travel: 8.00
Speed rpm : 350
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 1000
Rack travel in m: 14.50...14.60
2nd speed rpm : 650
Rack travel in m: 13.10...13.50
3rd speed rpm : 1100
Rack travel in m: 14.30...14.50
4th speed rpm : 750
Rack travel in m: 13.50...13.90

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 1000
Pressure hPa : 1200
Rack travel mm : 14.50...14.60

Measurement
Speed 1/min : 1000

1st pressure hPa : -
Rack travel in m: 9.90...10.30
2nd pressure hPa : 310
Rack travel in m: 11.30...11.40
3rd pressure hPa : 680

H12

Rack travel in m: 13.40...13.80

START CUT-OUT

Speed 1/min : 290 (300)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 650
Del.quantity cm³/ : 212.0...218.0
1000 s: (209.0...221.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: 1200
Speed rpm : 750
Del.quantity cm³/ : 225.0...231.0
1000 s: (222.0...234.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 90.5...94.5
1000 s: (88.5...92.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.30
Speed rpm : 1150...1160

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 190.0...230.0
1000 s: (185.0...235.0)
Rack travel in mm : 12.00...13.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.40...6.60
Del.quantity cm³/ : 23.0...29.0
1000 s: (21.0...31.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

: C.D.C. # 3922427

Start-of-delivery mark = 5.5° after
start of delivery cyl. 1.

Bow dimension:

Sliding-sleeve position = 37.0 mm



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 a3
 Edition : 23.10.92
 Replaces : 12.90
 Test oil : ISO-4113
 Combination no. : 0 402 746 852
 Injection pump
 Pump designation : PES6P120A720RS7157
 EP type number : 0 412 726 814
 Governor
 Governor design. : RQ1325...900PA909K
 Governor no. : 0 421 815 210

Customer-spec. information
 Customer : MACK TRUCKS

Engine : E7-400

1st version kW : 298.0
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve
 : 2 417 413 011

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900
 Rack travel in mm : 15.80...15.90
 Del. quantity cm³/ : 27.5...27.7
 100 s : (27.2...28.0)
 Spread cm³ : 0.5
 100 s : (0.9)

2nd speed rpm : 325.0
 Rack travel in mm : 5.1...5.3
 Del. quantity cm³/ : 4.0...4.6
 100 s : (3.8...4.8)
 Spread cm³ : 0.8
 100 s : (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.20...1.40
 2nd speed rpm : 450
 travel mm : 2.80...3.20
 3rd speed rpm : 650
 travel mm : 5.60...5.80
 4th speed rpm : 900
 travel mm : 8.30...8.50
 5th speed rpm : 1100
 travel mm : 10.30...10.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 900
 Aneroid pressure h: 1200
 Del. quantity : 275.0...277.0
 1000 : (272.0...280.0)
 Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 58...66

Testing:
1st rack travel in: 14.80
Speed rpm : 940...950
2nd rack travel in: 4.00
Speed rpm : 1105...1135
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 7...15

Testing:
Speed rpm : 275
Minimum rack travel: 6.30
Speed rpm : 325
Rack travel in mm : 5.10...5.30

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 900
Rack travel in m: 15.80...15.90
2nd speed rpm : 625
Rack travel in m: 15.20...15.40
3rd speed rpm : 700
Rack travel in m: 15.40...15.60
4th speed rpm : 500
Rack travel in m: 0.00...13.50

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 900
Pressure hPa : 1200
Rack travel mm : 15.80...15.90

Measurement
Speed 1/min : 900

1st pressure hPa : -
Rack travel in m: 8.50...8.90
2nd pressure hPa : 325
Rack travel in m: 10.20...10.30
3rd pressure hPa : 790
Rack travel in m: 13.80...14.20

START CUT-OUT

H15

Speed 1/min : 275 (285)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 625
Del.quantity cm³/ : 302.5...308.5
1000 s: (299.5...311.5)
Spread cm³ : 8.00
1000 s: (12.0)
Speed rpm : 850
Del.quantity cm³/ : 159.0...161.0 *
1000 s: (136.5.. 157.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 157.5...161.5
1000 s: (155.5...163.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 14.80
Speed rpm : 940...950

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 190.0...230.0
1000 s: (180.0...240.0)
Rack travel in mm : 10.80...11.40

LOW IDLE

Speed rpm : 325
Rack travel in mm : 5.10...5.30
Del.quantity cm³/ : 40.0...46.0
1000 s: (38.0...48.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:
: MACK # 313GC5185-P6

Bow dimension:
Sliding-sleeve position = 37.0 mm
* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 a4
 Edition : 23.10.92
 Replaces : 12.90
 Test oil : ISO-4113

 Combination no. : 0 402 746 853

 Injection pump
 Pump designation : PES6P120A720RS7157
 EP type number : 0 412 726 814
 Governor
 Governor design. : RQV325...90GPA909-1K
 Governor no. : 0 421 815 211

Customer-spec. information
 Customer : MACK TRUCKS

Engine : E7-350

1st version kW : 261.0
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 2 417 413 011

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 10.50
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.60...13.70

Del. quantity cm³/ : 23.1...23.3

100 s: (22.9...23.5)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.7...4.9

Del. quantity cm³/ : 4.0...4.6

100 s: (3.8...4.8)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 650

travel mm : 5.60...5.80

4th speed rpm : 900

travel mm : 8.30...8.50

5th speed rpm : 1100

travel mm : 10.30...10.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del. quantity : 231.5...233.5

1000 : (229.5...235.5)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 58...66

Testing:
1st rack travel in: 12.60
Speed rpm : 940...950
2nd rack travel in: 4.00
Speed rpm : 1080...1110
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 7...15

Testing:
Speed rpm : 275
Minimum rack travel: 5.90
Speed rpm : 325
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION
Speed rpm : 325...520

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 900
Rack travel in m: 13.60...13.70
2nd speed rpm : 625
Rack travel in m: 13.30...13.50
3rd speed rpm : 500
Rack travel in m: 0.00...12.00

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 900
Pressure hPa : 1200
Rack travel mm : 13.60...13.70

Measurement
Speed 1/min : 900

1st pressure hPa : -
Rack travel in m: 8.00...8.40
2nd pressure hPa : 325
Rack travel in m: 9.40...9.50
3rd pressure hPa : 685
Rack travel in m: 12.10...12.50

START CUT-OUT

Speed 1/min : 275 (285)

H17

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 625
Del.quantity cm³/ : 263.0...269.0
1000 s: (260.0...272.0)
Spread cm³ : 8.00
1000 s: (12.0)
Speed rpm : 850
Del.quantity cm³/ : 159.0...161.0 *
1000 s: (136.5...157.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 153.0...157.0
1000 s: (151.0...159.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.60
Speed rpm : 940...950

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 175.0...215.0
1000 s: (165.0...225.0)
Rack travel in mm : 9.00...11.00

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.70...4.90
Del.quantity cm³/ : 40.0...46.0
1000 s: (38.0...48.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

: MACK # 313GC5185-P2

Bow dimension:

Sliding-sleeve position = 37.0 mm
* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PER 12,2 f1
 Edition : 30.10.92
 Replaces : 09.90
 Test oil : ISO-4113
 Combination no. : 0 402 746 882
 Injection pump
 Pump designation : PES6P120A32ORS7156-1
 EP type number : 0 412 726 830
 Governor
 Governor design. : RQV35J...10SCPA941-1
 Governor no. : 0 421 813 887

Customer-spec. information
 Customer : PERKINS

Engine : 2006 TW-H

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 1 688 901 019
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,8
 Test lines : 1 680 750 067
 Outside diameter
 x Wall thickness
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 4.50...4.60
 : (4.45...4.65)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 4- 2- 6- 3- 5

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050
 Rack travel in mm : 14.00...14.10
 Del. quantity cm³/ : 26.9...27.1
 100 s: (26.6...27.4)
 Spread cm³ : 0.5
 100 s: (0.9)

2nd speed rpm : 350.0
 Rack travel in mm : 7.8...8.4
 Del. quantity cm³/ : 6.3...6.9
 100 s: (6.1...7.1)
 Spread cm³ : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350
 travel mm : 0.50...0.90
 2nd speed rpm : 447
 travel mm : 4.40...4.90
 3rd speed rpm : 540
 travel mm : 4.90...5.10
 4th speed rpm : 1104
 travel mm : 5.20...5.40
 5th speed rpm : 1134
 travel mm : 5.90...6.10

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -2
 Speed rpm : 800
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1050
 Aneroid pressure h: 1200
 Del. quantity : 269.0...271.0
 1000 : (266.0...274.0)

Spread cm³ : 5.00
1000 : (9.00)

RATED SPEED

1st version

Control lever
position degrees: 98...106

Testing:

1st rack travel in: 13.00
Speed rpm : 1090...1105
2nd rack travel in: 4.00
Speed rpm : 1180...1210
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 66...74

Testing:

Speed rpm : 200
Minimum rack travel: 10.00
Speed rpm : 350
Rack travel in mm : 8.00...8.20
Rack travel in mm : 2.00
Speed rpm : 400...460
Speed rpm : 500
Maximum rack travel: 1.80

CONSTANT REGULATION

Speed rpm : 350...420

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : 1200
Rack travel mm : 14.00...14.10

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.70...11.10
2nd pressure hPa : 710
Rack travel in m: 13.10...13.20
3rd pressure hPa : 560
Rack travel in m: 11.80...12.00

START CUT-OUT

Speed 1/min : 300 (320)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 600
Del.quantity cm³/ : 275.0...281.0
1000 s: (272.0...284.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 600
Del.quantity cm³/ : 182.0...184.0
1000 s: (179.0...187.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.00
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 185.0...225.0
1000 s: (181.0...229.0)

Remarks:

:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring
preload on new delivery-valve holders
to 2.9...3.1 mm.

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 h3
 Edition : 23.10.92
 Replaces : 09.92
 Test oil : ISO-4113

 Combination no. : 0 402 746 887

 Injection pump
 Pump designation : PES6P120A72ORS7200
 EP type number : 0 412 726 833
 Governor
 Governor design. : RQV325...975PA944-2K
 Governor no. : 0 421 815 237

Customer-spec. information
 Customer : MACK TRUCKS

Engine : E7-300A

1st version kW : 224.0
 Rated speed : 1950
 2nd version kW : 224.0
 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 2 417 413 011

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 11.00...13.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 975

Rack travel in mm : 13.00...13.10

Del. quantity cm³/ : 21.8...22.0

100 s: (21.5...22.3)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 340.0

Rack travel in mm : 4.8...5.0

Del. quantity cm³/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm³ : 0.8

100 s: (1.2)

1st speed rpm : 975

Rack travel in mm : 13.0...13.1

Del. quantity cm³/ : 22.5...22.7

100 s: (22.2...23.0)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 340

Rack travel in mm : 4.8...5.0

Del. quantity cm³/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.40...1.60

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 950

travel mm : 7.90...8.10

4th speed rpm : 1200
travel mm : 10.20...10.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 975
Aneroid pressure h: 1200
Del. quantity : 218.5...220.5
1000 : (215.5...223.5)
Spread cm³ : 5.00
1000 : (9.00)

2nd version

Speed rpm : 975
Aneroid pressure h: 1200
Del. quantity cm³/ : 225.0...227.0
1000 s: (222.0...230.0)
Spread cm³ : 5.00
1000 s: (9.00)

RATED SPEED

1st version

Control lever
position degrees: 57...65

Testing:

1st rack travel in: 12.00
Speed rpm : 1015...1025
2nd rack travel in: 4.00
Speed rpm : 1170...1200
4th rack travel in: 1300
Speed rpm : 0.00...1.00

2nd version

Control lever
position degrees: 57...65

Testing:

1st rack travel in: 12.00
Speed rpm : 1015...1045
2nd rack travel in: 4.00
Speed rpm : 1180...1190
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 8...16
Setting point w/out bumper spring
Speed rpm : 340
Rack travel in mm : 4.9

Testing:

Speed rpm : 275
Minimum rack travel: 6.00
Speed rpm : 340
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 975
Rack travel in m: 13.00...13.10
2nd speed rpm : 600
Rack travel in m: 12.20...12.40
3rd speed rpm : 500
Rack travel in m: 11.20...11.60

Torque control curve - 2nd version

1st speed rpm : 975
Rack travel in m: 13.0...13.1
2nd speed rpm : 600
Rack travel in m: 12.2...12.4
3rd speed rpm : 500
Rack travel in m: 11.2...11.6

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 975
Pressure hPa : 1200
Rack travel mm : 13.00...13.10

Measurement

Speed 1/min : 975

1st pressure hPa : -
Rack travel in m: 8.00...8.40
2nd pressure hPa : 325
Rack travel in m: 9.40...9.50
3rd pressure hPa : 640
Rack travel in m: 11.70...12.10

2nd version

Setting
Speed rpm : 975
Pressure hPa : 1200
Rack travel in mm : 13.0...13.1

Measurement

Speed rpm : 975

1st pressure hPa : -
Rack travel in m: 8.00...8.40
2nd pressure hPa : 325
Rack travel in m: 9.40...9.50
3rd pressure hPa : 640
Rack travel in m: 11.7...12.1

START CUT-OUT

Speed 1/min : 250 (255)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 600
Del.quantity cm3/ : 238.5...244.5
1000 s: (235.5...247.5)
Spread cm3 : 8.00
1000 s: (12.0)
Speed rpm : 875
Del.quantity cm3/ : 199.0...201.0 *
1000 s: (180.5...207.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 149.0...153.0
1000 s: (147.0...155.0)

2nd version

Aneroid pressure h: 1200
Speed rpm : 600
Del.quantity cm3/ : 240.5...246.5
1000 s: (237.5...249.5)
Spread cm3 : 8.00
1000 s: (12.0)
Speed rpm : 875
Del.quantity cm3/ : 199.0...201.0 *
1000 s: (180.5...207.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 149.0...153.0
1000 s: (147.0...155.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 12.00
Speed rpm : 1015...1025

2nd version

1mm rack travel less than
full load rack tr: 12.00
Speed rpm : 1015...1045

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 19.00...21.00

Speed rpm : 100
Del.quantity cm3/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 19.0...21.0

LOW IDLE

H22

Speed rpm : 340
Rack travel in mm : 4.80...5.00
Del.quantity cm3/ : 31.0...37.0
1000 s: (29.0...39.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P8

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm
* This test specification applies only
to the engine/nozzle-and-holder
assemblies on an injection-pump test
bench: setting for test equipment,
check value for engine equipment.

Test specifications for versions 1
only apply to injection pumps with
constant-pressure valve 2 418 559 029
and spring 2 414 612 005.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 h
 Edition : 23.10.92
 Replaces : 21.9.92
 Test oil : ISO-4113
 Combination no. : 0 402 746 890
 Injection pump
 Pump designation : PES6P120A72ORS7200
 EP type number : 0 412 726 833
 Governor
 Governor design. : RQV325...875PA944-5K
 Governor no. : 0 421 815 240

Customer-spec. information
 Customer : MACK TRUCKS

Engine : EM7-275

1st version kW : 202.0
 Rated speed : 1750
 2nd version kW : 202.0
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 2 417 413 011
 Overflow
 quantity min. 1/h: 160...170
 Test nozzle holder
 assembly : 1 688 901 101
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,6
 Test lines : 1 680 750 008
 Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24
 Prestroke mm : 3.25...3.35
 : (3.20...3.40)
 Rack travel in mm : 11.00...13.00
 Firing order : 1- 5- 3- 6- 2- 4
 Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875
 Rack travel in mm : 13.20...13.30
 Del. quantity cm³/ : 23.4...23.6
 100 s: (23.1...23.9)
 Spread cm³ : 0.5
 100 s: (0.9)
 2nd speed rpm : 340.0
 Rack travel in mm : 4.6...4.8
 Del. quantity cm³/ : 3.1...3.7
 100 s: (2.9...3.9)
 Spread cm³ : 0.8
 100 s: (1.2)
 1st speed rpm : 875
 Rack travel in mm : 13.2...13.3
 Del. quantity cm³/ : 23.5...23.7
 100 s: (23.2...24.0)
 Spread cm³ : 0.5
 100 s: (0.9)
 2nd speed rpm : 340
 Rack travel in mm : 4.60...4.80
 Del. quantity cm³/ : 3.1...3.7
 100 s: (2.9...3.9)
 Spread cm³ : 0.8
 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.40...1.60
 2nd speed rpm : 450
 travel mm : 3.30...3.70
 3rd speed rpm : 700
 travel mm : 7.90...8.30

4th speed rpm : 900
travel mm : 9.40...9.60
5th speed rpm : 1050
travel mm : 10.60...11.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875
Aneroid pressure h: 1200
Del. quantity : 234.0...236.0
1000 : (231.0...239.0)
Spread cm³ : 5.00
1000 : (9.00)

2nd version

Speed rpm : 875
Aneroid pressure h: 1200
Del. quantity cm³/ : 235.5...237.5
1000 s: (232.5...240.5)
Spread cm³ : 5.00
1000 s: (9.00)

RATED SPEED

1st version

Control lever
position degrees: 60...68

Testing:

1st rack travel in: 12.20
Speed rpm : 915...925
2nd rack travel in: 4.00
Speed rpm : 1055...1085
4th rack travel in: 1200
Speed rpm : 0.00...1.00

2nd version

Control lever
position degrees: 60...68

Testing:

1st rack travel in: 12.20
Speed rpm : 915...945
2nd rack travel in: 4.00
Speed rpm : 1065...1075
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 8...16

Testing:

Speed rpm : 275
Minimum rack travel: 6.00
Speed rpm : 340
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 13.20...13.30
2nd speed rpm : 510
Rack travel in m: 13.80...14.00
3rd speed rpm : 600
Rack travel in m: 13.80...14.00
4th speed rpm : 450
Rack travel in m: 12.90...13.30

Torque control curve - 2nd version

1st speed rpm : 875
Rack travel in m: 13.2...13.3
2nd speed rpm : 510
Rack travel in m: 13.8...14.0
3rd speed rpm : 600
Rack travel in m: 13.8...14.0
4th speed rpm : 450
Rack travel in m: 12.9...13.3

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel mm : 13.80...14.00

Measurement

Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 8.40...8.80
2nd pressure hPa : 310
Rack travel in m: 10.10...10.20
3rd pressure hPa : 635
Rack travel in m: 12.60...13.00

2th version

Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel in mm : 13.8...14.0

Measurement

Speed rpm : 510

1st pressure hPa : -
Rack travel in m: 8.40...8.80
2nd pressure hPa : 310
Rack travel in m: 10.1...10.2
3rd pressure hPa : 635
Rack travel in m: 12.6...13.0

START CUT-OUT

Speed 1/min : 250 (255)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm³/ : 311.0...317.0
1000 s: (308.0...320.0)
Spread cm³ : 8.00
1000 s: (12.0)

Speed rpm : 875
Del.quantity cm³/ : 199.0...201.0 *
1000 s: (150.0...172.0)

Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 155.5...159.5
1000 s: (153.5...161.5)

2nd version

Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm³/ : 311.0...317.0
1000 s: (308.0...320.0)
Spread cm³ : 8.00
1000 s: (12.0)

Speed rpm : 875
Del.quantity cm³/ : 199.0...201.0 *
1000 s: (150.0...172.0)

Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 155.5...159.5
1000 s: (153.5...161.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.20
Speed rpm : 915...925

2nd version

1mm rack travel less than
full load rack tr: 12.20
Speed rpm : 915...945

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 19.00...21.00

Speed rpm : 100
Del.quantity cm³/ : 170.0...210.0
1000 s: (160.0...220.0)

H25

Rack travel in mm : 19.00...21.0

LOW IDLE

Speed rpm : 340
Rack travel in mm : 4.60...4.80
Del.quantity cm³/ : 31.0...37.0
1000 s: (29.0...39.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P4

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm
* This test specification applies only to the engine/nozzle-and-holder assemblies on an injection-pump test bench: setting for test equipment, check value for engine equipment.

Test specifications for versions 1 only apply to injection pumps with constant-pressure valve 2 418 559 029 and spring 2 414 612 005.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 h4
 Edition : 23.10.92
 Replaces : 09.92
 Test oil : ISO-4113

Combination no. : 0 402 746 891

Injection pump
 Pump designation : PES6P120A720RS7200
 EP type number : 0 412 726 833
 Governor
 Governor design. : RQV325...875FA944-6K
 Governor no. : 0 421 815 241

Customer-spec. information
 Customer : MACK TRUCKS

Engine : EM7-250

1st version kW : 187.0
 Rated speed : 1750
 2nd version kW : 187.0
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 2 417 413 011

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.25...3.35
 : (3.20...3.40)

Rack travel in mm : 11.00...13.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - * : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 21.3...21.5
 100 s: (21.0...21.8)

Spread cm3 : 0.5
 100 s: (0.9)

2nd speed rpm : 340.0
 Rack travel in mm : 4.6...4.8
 Del.quantity cm3/ : 3.1...3.7
 100 s: (2.9...3.9)

Spread cm3 : 0.8
 100 s: (1.2)

1st speed rpm : 875
 Rack travel in mm : 12.5...12.6
 Del.quantity cm3/ : 21.5...21.7
 100 s: (21.2...22.0)

Spread cm3 : 0.5
 100 s: (0.9)

2nd speed rpm : 340
 Rack travel in mm : 4.60...4.80
 Del.quantity cm3/ : 3.1...3.7
 100 s: (2.9...3.9)

Spread cm3 : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.40...1.60

2nd speed rpm : 450
 travel mm : 3.30...3.70

3rd speed rpm : 700
 travel mm : 7.90...8.30

4th speed rpm : 900
travel mm : 9.40...9.60
5th speed rpm : 1050
travel mm : 10.60...11.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 875
Aneroid pressure h: 1200
Del. quantity : 213.0...215.0
1000 : (210.0...218.0)
Spread cm³ : 5.00
1000 : (9.00)

2nd version
Speed rpm : 875
Aneroid pressure h: 1200
Del. quantity cm³/ : 215.0...217.0
1000 s: (212.0...220.0)
Spread cm³ : 5.00
1000 s: (9.00)

RATED SPEED

1st version
Control lever
position degrees: 62...70

Testing:
1st rack travel in: 11.50
Speed rpm : 915...925
2nd rack travel in: 4.00
Speed rpm : 1035...1065
4th rack travel in: 1200
Speed rpm : 0.00...1.00

2nd version
Control lever
position degrees: 62...70

Testing:
1st rack travel in: 11.50
Speed rpm : 915...945
2nd rack travel in: 4.00
Speed rpm : 1045...1055
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 8...16

Testing:
Speed rpm : 275
Minimum rack travel: 6.00
Speed rpm : 340
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION
Speed rpm : 325...520

H27

TORQUE CONTROL
Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 12.50...12.60
2nd speed rpm : 510
Rack travel in m: 13.40...13.60
3rd speed rpm : 600
Rack travel in m: 13.40...13.60
4th speed rpm : 450
Rack travel in m: 12.60...13.00

Aneroid/Altitude Compensator Test

1st version
Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel mm : 13.40...13.60

Measurement
Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 8.50...8.90
2nd pressure hPa : 285
Rack travel in m: 10.00...10.10
3rd pressure hPa : 570
Rack travel in m: 12.30...12.70

2th version
Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel in mm : 13.4...13.6

Measurement
Speed rpm : 510

1st pressure hPa : -
Rack travel in m: 8.50...8.90
2nd pressure hPa : 285
Rack travel in m: 10.0...10.1
3rd pressure hPa : 570
Rack travel in m: 12.3...12.7

START CUT-OUT

Speed 1/min : 250 (255)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 510
Del. quantity cm³/ : 291.5...297.5
1000 s: (288.5...300.5)

Spread cm³ : 8.00
1000 s : (12.0)
Speed rpm : 875
Del.quantity cm³/ : 199.0...201.0 *
1000 s : (150.0...172.0)
Aneroid pressure h : -
Speed rpm : 400
Del.quantity cm³/ : 153.0...157.0
1000 s : (151.0...159.0)

2nd version

Aneroid pressure h : 1200
Speed rpm : 510
Del.quantity cm³/ : 291.5...297.5
1000 s : (288.5...300.5)
Spread cm³ : 8.00
1000 s : (12.0)
Speed rpm : 875
Del.quantity cm³/ : 199.0...201.0 *
1000 s : (150.0...172.0)
Aneroid pressure h : -
Speed rpm : 400
Del.quantity cm³/ : 153.0...157.0
1000 s : (151.0...159.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.50
Speed rpm : 915...925

2nd version

1mm rack travel less than
full load rack tr: 11.50
Speed rpm : 915...945

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 170.0...210.0
1000 s : (160.0...220.0)
Rack travel in mm : 19.00...21.00

Speed rpm : 100
Del.quantity cm³/ : 170.0...210.0
1000 s : (160.0...220.0)
Rack travel in mm : 19.0...21.0

LOW IDLE

Speed rpm : 340
Rack travel in mm : 4.60...4.80
Del.quantity cm³/ : 31.0...37.0
1000 s : (29.0...39.0)
Spread cm³ : 8.00
1000 s : (12.00)

Remarks:

: MACK # 313GC5188-P2

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm
* This test specification applies only
to the engine/nozzle-and-holder
assemblies on an injection-pump test
bench: setting for test equipment,
check value for engine equipment.

Test specifications for versions 1
only apply to injection pumps with
constant-pressure valve 2 418 559 029
and spring 2 414 612 005.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 h5
 Edition : 23.10.92
 Replaces : 09.92
 Test oil : ISO-4113

Combination no. : 0 402 746 892

Injection pump
 Pump designation : PES6P120A720RS7200
 EP type number : 0 412 726 833
 Governor
 Governor design. : RQV325...975PA944-7K
 Governor no. : 0 421 815 242

Customer-spec. information
 Customer : MACK TRUCKS

Engine : E7-250A

1st version kW : 180.0
 Rated speed : 1950
 2nd version kW : 180.0
 Rated speed : 1950

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.25...3.35
 : (3.20...3.40)
 Rack travel in mm : 11.00...13.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 975

Rack travel in mm : 12.30...12.40

Del.quantity cm³/ : 20.2...20.4

100 s: (19.9...20.7)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 340.0

Rack travel in mm : 4.8...5.0

Del.quantity cm³/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm³ : 0.8

100 s: (1.2)

1st speed rpm : 975

Rack travel in mm : 12.3...12.4

Del.quantity cm³/ : 20.5...20.7

100 s: (20.2...21.0)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 340

Rack travel in mm : 4.80...5.00

Del.quantity cm³/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.40...1.60

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 950

travel mm : 7.90...8.10

4th speed rpm : 1200
travel mm : 10.20...10.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 975
Aneroid pressure h: 1200
Del. quantity : 202.0...204.0
1000 : (199.0...207.0)
Spread cm³ : 5.00
1000 : (9.00)

2nd version

Speed rpm : 975
Aneroid pressure h: 1200
Del. quantity cm³/ : 205.5...207.5
1000 s: (202.5...210.5)
Spread cm³ : 5.00
1000 s: (9.00)

RATED SPEED

1st version

Control lever
position degrees: 57...65

Testing:

1st rack travel in: 11.30
Speed rpm : 1015...1025
2nd rack travel in: 4.00
Speed rpm : 1165...1195
4th rack travel in: 1300
Speed rpm : 0.00...1.00

2nd version

Control lever
position degrees: 57...65

Testing:

1st rack travel in: 11.30
Speed rpm : 1015...1045
2nd rack travel in: 4.00
Speed rpm : 1175...1185
4th rack travel in: 1300
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 8...16

Testing:

Speed rpm : 275
Minimum rack travel: 6.00
Speed rpm : 340
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

J02

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 975
Rack travel in m: 12.30...12.40
2nd speed rpm : 600
Rack travel in m: 12.10...12.30
3rd speed rpm : 800
Rack travel in m: 12.30...12.50
4th speed rpm : 500
Rack travel in m: 11.40...11.80

Torque control curve - 2nd version

1st speed rpm : 975
Rack travel in m: 12.3...12.4
2nd speed rpm : 600
Rack travel in m: 12.1...12.3
3rd speed rpm : 800
Rack travel in m: 12.3...12.5
4th speed rpm : 500
Rack travel in m: 11.4...11.8

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 975
Pressure hPa : 1200
Rack travel mm : 12.30...12.40

Measurement

Speed 1/min : 975

1st pressure hPa : -
Rack travel in m: 8.50...8.90
2nd pressure hPa : 330
Rack travel in m: 9.70...9.80
3rd pressure hPa : 570
Rack travel in m: 11.40...11.80

2th version

Setting
Speed rpm : 975
Pressure hPa : 1200
Rack travel in mm : 12.3...12.4

Measurement

Speed rpm : 975

1st pressure hPa : -
Rack travel in m: 8.50...8.90
2nd pressure hPa : 330
Rack travel in m: 9.70...9.80
3rd pressure hPa : 570
Rack travel in m: 11.4...11.8

START CUT-OUT

Speed 1/min : 250 (255)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 600
Del.quantity cm³/ : 233.0...239.0
1000 s: (230.0...242.0)
Spread cm³ : 8.00
1000 s: (12.0)
Speed rpm : 875
Del.quantity cm³/ : 199.0...201.0 *
1000 s: (150.0...172.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 154.0...158.0
1000 s: (152.0...160.0)

2nd version

Aneroid pressure h: 1200
Speed rpm : 600
Del.quantity cm³/ : 233.0...239.0
1000 s: (230.0...242.0)
Spread cm³ : 8.00
1000 s: (12.0)
Speed rpm : 875
Del.quantity cm³/ : 199.0...201.0 *
1000 s: (150.0...172.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 154.0...158.0
1000 s: (152.0...160.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 11.30
Speed rpm : 1015...1025

2nd version

1mm rack travel less than
full load rack tr: 11.30
Speed rpm : 1015...1045

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 19.00...21.00

Speed rpm : 100
Del.quantity cm³/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 19.0...21.0

LOW IDLE

Speed rpm : 340
Rack travel in mm : 4.80...5.00
Del.quantity cm³/ : 31.0...37.0
1000 s: (29.0...39.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P6

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm
* This test specification applies only
to the engine/nozzle-and-holder
assemblies on an injection-pump test
bench: setting for test equipment,
check value for engine equipment.

Test specifications for versions 1
only apply to injection pumps with
constant-pressure valve 2 418 559 029
and spring 2 414 612 005.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 h2
 Edition : 23.10.92
 Replaces : 21.9.92
 Test oil : ISO-4113

 Combination no. : 0 402 746 896

 Injection pump
 Pump designation : PES6P120A72ORS7200
 EP type number : 0 412 726 833
 Governor
 Governor design. : RQV325...900FA944-11
 K
 Governor no. : 0 421 815 260

Customer-spec. information
 Customer : MACK TRUCKS

Engine : E7-350

1st version kW : 261.0
 Rated speed : 1800
 2nd version kW : 251.0
 Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 2 417 413 011

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 2.75...2.85
 : (2.70...2.90)
 Rack travel in mm : 11.00...13.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 14.50...14.60

Del. quantity cm³/ : 27.1...27.3

100 s: (26.8...27.6)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 340.0

Rack travel in mm : 4.6...4.8

Del. quantity cm³/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm³ : 0.8

100 s: (1.2)

1st speed rpm : 900

Rack travel in mm : 14.5...14.6

Del. quantity cm³/ : 27.7...27.9

100 s: (27.4...27.9)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 340

Rack travel in mm : 4.60...4.80

Del. quantity cm³/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.40...1.60

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 700

travel mm : 6.00...6.40
4th speed rpm : 900
travel mm : 8.50...8.70
5th speed rpm : 1050
travel mm : 9.80...10.20

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900
Aneroid pressure h : 1200
Del. quantity : 271.0...273.0
1000 : (268.0...276.0)
Spread cm³ : 5.00
1000 : (9.00)

2nd version

Speed rpm : 900
Aneroid pressure h : 1200
Del. quantity cm³/ : 277.5...279.5
1000 s : (274.5...282.5)
Spread cm³ : 5.00
1000 s : (9.00)

RATED SPEED

1st version

Control lever
position degrees : 59...67

Testing:

1st rack travel in : 13.50
Speed rpm : 940...950
2nd rack travel in : 4.00
Speed rpm : 1105...1135
4th rack travel in : 1200
Speed rpm : 0.00...1.00

2nd version

Control lever
position degrees : 59...67

Testing:

1st rack travel in : 13.50
Speed rpm : 940...990
2nd rack travel in : 4.00
Speed rpm : 1115...1125
4th rack travel in : 1200
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees : 8...16

Testing:

Speed rpm : 275
Minimum rack travel : 6.00
Speed rpm : 340
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION

J05

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 900
Rack travel in m : 14.50...14.60
2nd speed rpm : 625
Rack travel in m : 13.80...14.00
3rd speed rpm : 675
Rack travel in m : 13.80...14.00
4th speed rpm : 500
Rack travel in m : 11.90...12.70

Torque control curve - 2nd version

1st speed rpm : 900
Rack travel in m : 14.5...14.6
2nd speed rpm : 625
Rack travel in m : 13.8...14.0
3rd speed rpm : 675
Rack travel in m : 13.8...14.0
4th speed rpm : 500
Rack travel in m : 11.9...12.7

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 900
Pressure hPa : 1200
Rack travel mm : 14.50...14.60

Measurement

Speed 1/min : 900
1st pressure hPa : -
Rack travel in m : 7.90...8.30
2nd pressure hPa : 400
Rack travel in m : 9.80...9.90
3rd pressure hPa : 775
Rack travel in m : 12.60...13.00

2th version

Setting
Speed rpm : 900
Pressure hPa : 1200
Rack travel in mm : 14.5...14.6

Measurement

Speed rpm : 900
1st pressure hPa : -
Rack travel in m : 8.10...8.50
2nd pressure hPa : 400
Rack travel in m : 9.80...9.90
3rd pressure hPa : 775
Rack travel in m : 12.6...13.0

START CUT-OUT

Speed 1/min : 250 (255)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 625
Del.quantity cm³/ : 290.0...296.0
1000 s: (287.0...299.0)
Spread cm³ : 8.00
1000 s: (12.0)
Speed rpm : 875
Del.quantity cm³/ : 199.0...201.0 *
1000 s: (180.5...207.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 150.0...154.0
1000 s: (148.0...156.0)

2nd version

Aneroid pressure h: 1200
Speed rpm : 625
Del.quantity cm³/ : 290.0...296.0
1000 s: (287.0...299.0)
Spread cm³ : 8.00
1000 s: (12.0)
Speed rpm : 875
Del.quantity cm³/ : 199.0...201.0 *
1000 s: (180.5...207.5)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm³/ : 150.0...154.0
1000 s: (148.0...156.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.50
Speed rpm : 940...950

2nd version

1mm rack travel less than
full load rack tr: 13.50
Speed rpm : 940...990

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 19.00...21.00

Speed rpm : 100

Del.quantity cm³/ : 170.0...210.0
1000 s: (160.0...220.0)
Rack travel in mm : 19.0...21.0

LOW IDLE

Speed rpm : 340
Rack travel in mm : 4.60...4.80
Del.quantity cm³/ : 31.0...37.0
1000 s: (29.0...39.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P12

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm
* This test specification applies only
to the engine/nozzle-and-holder
assemblies on an injection-pump test
bench: setting for test equipment,
check value for engine equipment.

Test specifications for versions 1
only apply to injection pumps with
constant-pressure valve 2 418 559 029
and spring 2 414 612 005.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAC 12,0 h.1
 Edition : 23.10.92
 Replaces : 09.92
 Test oil : ISO-4113
 Combination no. : 0 402 746 897
 Injection pump
 Pump designation : PES6P120A720RS7200
 EP type number : 0 412 726 833
 Governor
 Governor design. : RGV325...875PA944-12
 K
 Governor no. : 0 421 815 261

Customer-spec. information
 Customer : MACK TRUCKS

Engine : EM7-300

1st version kw : 224.0
 Rated speed : 1750
 2nd version kw : 224.0
 Rated speed : 1750

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 2 417 413 011

Overflow
 quantity min. 1/h: 160...170

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24
 Prestroke mm : 3.25...3.35
 : (3.20...3.40)
 Rack travel in mm : 11.00...13.00
 Firing order : 1- 5- 3- 6- 2- 4
 Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 875
 Rack travel in mm : 14.20...14.30
 Del. quantity cm³/ : 25.3...25.5
 100 s: (25.0...25.8)
 Spread cm³ : 0.5
 100 s: (0.9)

2nd speed rpm : 340.0
 Rack travel in mm : 4.6...4.8
 Del. quantity cm³/ : 3.1...3.7
 100 s: (2.9...3.9)
 Spread cm³ : 0.8
 100 s: (1.2)

1st speed rpm : 875
 Rack travel in mm : 14.0...14.1
 Del. quantity cm³/ : 25.0...25.2
 100 s: (24.7...25.5)
 Spread cm³ : 0.5
 100 s: (0.9)

2nd speed rpm : 340
 Rack travel in mm : 4.6...4.8
 Del. quantity cm³/ : 3.1...3.7
 100 s: (2.9...3.9)
 Spread cm³ : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 325
 travel mm : 1.40...1.60
 2nd speed rpm : 450
 travel mm : 3.30...3.70
 3rd speed rpm : 700

travel mm : 7.90...8.30
4th speed rpm : 900
travel mm : 9.40...9.60
5th speed rpm : 1050
travel mm : 10.60...11.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 875
Aneroid pressure h: 1200
Del. quantity : 253.5...255.5
1000 : (250.5...258.5)
Spread cm³ : 5.00
1000 : (9.00)

2nd version

Speed rpm : 875
Aneroid pressure h: 1200
Del. quantity cm³/ : 250.0...255.0
1000 s: (247.0...258.0)
Spread cm³ : 5.00
1000 s: (9.00)

RATED SPEED

1st version

Control lever
position degrees: 61...69

Testing:

1st rack travel in: 13.20
Speed rpm : 915...925
2nd rack travel in: 4.00
Speed rpm : 1065...1095
4th rack travel in: 1200
Speed rpm : 0.00...1.00

2nd version

Control lever
position degrees: 61...69

Testing:

1st rack travel in: 13.00
Speed rpm : 915...965
2nd rack travel in: 4.00
Speed rpm : 1075...1085
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 8...16

Testing:

Speed rpm : 275
Minimum rack travel: 6.00
Speed rpm : 340
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION

J08

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?
Torque control curve - 1st version
1st speed rpm : 875
Rack travel in m: 14.20...14.30
2nd speed rpm : 510
Rack travel in m: 14.80...15.00
3rd speed rpm : 575
Rack travel in m: 14.80...15.00
4th speed rpm : 450
Rack travel in m: 13.90...14.30

Torque control curve - 2nd version

1st speed rpm : 875
Rack travel in m: 14.0...14.1
2nd speed rpm : 510
Rack travel in m: 14.7...14.9
3rd speed rpm : 575
Rack travel in m: 14.7...14.9
4th speed rpm : 450
Rack travel in m: 13.9...14.3

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel mm : 14.80...15.00

Measurement

Speed 1/min : 510

1st pressure hPa : -
Rack travel in m: 8.70...9.10
2nd pressure hPa : 370
Rack travel in m: 10.30...10.40
3rd pressure hPa : 760
Rack travel in m: 13.30...13.70

2th version

Setting
Speed rpm : 510
Pressure hPa : 1200
Rack travel in mm : 14.7...14.9

Measurement

Speed rpm : 510

1st pressure hPa : -
Rack travel in m: 8.70...9.10
2nd pressure hPa : 370
Rack travel in m: 10.3...10.4
3rd pressure hPa : 760
Rack travel in m: 13.3...13.7

START CUT-OUT

Speed 1/min : 250 (255)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm3/ : 334.0...340.0
1000 s: (331.0...343.0)
Spread cm3 : 8.00
1000 s: (12.0)

Speed rpm : 875
Del.quantity cm3/ : 199.0...201.0 *
1000 s: (159.5...183.0)

Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 156.0...160.0
1000 s: (154.0...162.0)

2nd version

Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm3/ : 328.0...334.0
1000 s: (325.0...337.0)
Spread cm3 : 8.00
1000 s: (12.0)

Speed rpm : 875
Del.quantity cm3/ : 199.0...201.0 *
1000 s: (159.5...183.0)

Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/ : 156.0...160.0
1000 s: (154.0...162.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.20
Speed rpm : 915...925

2nd version

1mm rack travel less than
full load rack tr: 13.00
Speed rpm : 915...965

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 190.0...230.0
1000 s: (180.0...240.0)
Rack travel in mm : 19.00...21.00

Speed rpm : 100

Del.quantity cm3/ : 190.0...230.0
1000 s: (180.0...240.0)
Rack travel in mm : 19.0...21.0

LOW IDLE

Speed rpm : 340
Rack travel in mm : 4.60...4.80
Del.quantity cm3/ : 31.0...37.0
1000 s: (29.0...39.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P10

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm
* This test specification applies only
to the engine/nozzle-and-holder
assemblies on an injection-pump test
bench: setting for test equipment,
check value for engine equipment.

Test specifications for versions 1
only apply to injection pumps with
constant-pressure valve 2 418 559 029
and spring 2 414 612 005.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 12,0 k
 Edition : 23.10.92
 Replaces : 07.92
 Test oil : ISO-4113

Combination no. : 0 402 746 909

Injection pump
 Pump designation : PES6P120A320RS7236
 EP type number : 0 412 726 848
 Governor
 Governor design. : RQV275...1000PA1001
 -1
 Governor no. : 0 421 813 936

Customer-spec. information
 Customer : RVI

Engine : MIDR 063540 J/3

1st version kW : 306.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60
 : (4.45...4.65)
 Rack travel in mm : 13.00...14.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.60...13.70

Del.quantity cm³/ : 30.1...30.3

100 s: (29.8...30.6)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 4.9...5.3

Del.quantity cm³/ : 2.7...3.3

100 s: (2.4...3.6)

Spread cm³ : 0.8

100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1070
 travel mm : 8.30...8.50

2nd speed rpm : 275
 travel mm : 1.10...1.50

3rd speed rpm : 500
 travel mm : 3.60...4.20

4th speed rpm : 750
 travel mm : 5.70...6.10

5th speed rpm : 1400
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 301.0...303.0
1000 : (298.0...306.0)
Spread cm3 : 5.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 298...306

Testing:
1st rack travel in: 12.60
Speed rpm : 1065...1075
2nd rack travel in: 4.00
Speed rpm : 1195...1225
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 242...250

Testing:
Speed rpm : 200
Minimum rack travel: 6.20
Speed rpm : 275
Rack travel in mm : 5.00...5.20

CONSTANT REGULATION

Speed rpm : 310...430

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 1000
Rack travel mm : 13.60...13.70

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 8.20...8.60
2nd pressure hPa : 600
Rack travel in m: 12.60...12.70
3rd pressure hPa : 240
Rack travel in m: 9.60...10.00

START CUT-OUT

Speed 1/min : 225 (245)

FUEL DELIVERY CHARACTERISTICS

1st version

J11

Aneroid pressure h: 1000
Speed rpm : 1000
Del.quantity cm3/ : 276.0...282.0
1000 s: (273.0...285.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 145.0...147.0
1000 s: (142.0...150.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 12.60
Speed rpm : 1065...1075

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 150.0...170.0
1000 s: (146.0...174.0)

LOW IDLE

Speed rpm : 275
Rack travel in mm : 4.90...5.30
Del.quantity cm3/ : 27.0...33.0
1000 s: (24.0...36.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 23.10.92
 Replaces : 06.92
 Test oil : ISO-4113

Combination no. : 0 402 746 913X

Injection pump
 Pump designation : PES6P120A720LS7237
 -10

EP type number : 0 412 726 872
 Governor
 Governor design. : RQ300/1100PA1008-1
 Governor no. : 0 421 801 592

Cust. part no. : 0200747802

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM447 ha

1st version kW : 184.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.60...13.80

Del.quantity cm³/ : 19.8...20.0

100 s: (19.5...20.3)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.2...6.8

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1400

Del.quantity : 198.0...200.0

1000 : (195.0...203.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600
Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.70
Speed rpm : 1145...1160
2nd rack travel in: 4.00
Speed rpm : 1220...1250
4th rack travel in: 1300
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300
Rack travel in mm : 6.5

Testing:

Speed rpm : 200
Minimum rack travel: 8.30
Speed rpm : 300
Rack travel in mm : 6.40...6.60
Rack travel in mm : 2.00
Speed rpm : 370...410

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : -
Rack travel mm : 11.80...12.10

Measurement

Speed 1/min : 500

1st pressure hPa : 600
Rack travel in m: 12.30...12.40
2nd pressure hPa : 950
Rack travel in m: 13.00...13.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400
Speed rpm : 800
Del.quantity cm³/ : 201.0...205.0
1000 s: (198.0...208.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 144.0...146.0
1000 s: (141.0...149.0)

Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 12.70
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 60.0...80.0
1000 s: (56.0...84.0)
Rack travel in mm : 11.80...12.20

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : RVI 9,8 o 1
 Edition : 05.10.92
 Replaces : 08.91
 Test oil : ISO-4113
 Combination no. : 0 402 746 915
 Injection pump
 Pump designation : PES6P120A32ORS7232
 EP type number : 0 412 726 846
 Governor
 Governor design. : RQ275/105CPA999-2
 Governor no. : 0 421 801 594

Customer-spec. information

Customer : RVI
 Engine : MIDR 06-20-45

1st version kW : 250.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 1 688 901 105
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,8
 Test lines : 1 680 750 015
 Outside diameter
 x wall thickness
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.65...4.75
 : (4.60...4.80)
 Rack travel in mm : 18.00...21.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 600
 Rack travel in mm : 14.00...14.10
 Del. quantity cm³/ : 27.0...27.2
 100 s : (26.7...27.5)
 Spread cm³ : 0.5
 100 s : (0.9)

2nd speed rpm : 275.0
 Rack travel in mm : 5.60...6.00
 Del. quantity cm³/ : 3.2...3.6
 100 s : (2.9...3.9)
 Spread cm³ : 0.8
 100 s : (1.2)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -2
 Speed rpm : 600
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 600
 Aneroid pressure h: 1000
 Del. quantity : 270.0...272.0
 1000 : (267.0...275.0)
 Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
 Setting point:
 Speed rpm : 600
 Rack travel in mm : 20.0

Testing:
 1st rack travel in: 13.00
 Speed rpm : 1125...1140
 2nd rack travel in: 4.00

Speed rpm : 1245...1275
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 275
Rack travel in mm : 8.2

Testing:

Speed rpm : 175
Minimum rack travel: 7.30
Speed rpm : 275
Rack travel in mm : 5.70...5.90
Rack travel in mm : 2.00
Speed rpm : 384...420

TORQUE CONTROL

Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 600
Rack travel in m: 14.40...14.50
2nd speed rpm : 1050
Rack travel in m: 14.30...14.50

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 1000
Rack travel mm : 14.00...14.10

Measurement

Speed 1/min : 500
1st pressure hPa : -
Rack travel in m: 9.50...9.90
2nd pressure hPa : 560
Rack travel in m: 12.90...13.10
3rd pressure hPa : 200
Rack travel in m: 10.10...10.50

START CUT-OUT

Speed 1/min : 225 (245)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 1050
Del.quantity cm³/ : 245.0...251.0
1000 s: (242.0...254.0)
Aneroid pressure h: -
Speed rpm : 500

Del.quantity cm³/ : 126.0...128.0
1000 s: (123.0...131.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 13.00
Speed rpm : 1125...1140

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 140.0...170.0
1000 s: (136.0...174.0)

LOW IDLE

Speed rpm : 275
Rack travel in mm : 5.60...6.00
Del.quantity cm³/ : 32.0...36.0
1000 s: (29.0...39.0)
Spread cm³ : 8.00
1000 s: (12.00)

Remarks:

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 23.10.92
 Replaces : 06.92
 Test oil : ISO-4113

Combination no. : 0 402 746 916X

Injection pump
 Pump designation : PES6P120A720LS7237-1
 EP type number : 0 412 726 872
 Governor
 Governor design. : RQ30J/1100PA1010
 Governor no. : 0 421 801 596

Cust. part no. : 0200747902

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM447 HA

1st version kW : 184.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness : 8.00X2.50X1000
 x Length mm

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - * : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.60...13.80

Del.quantity cm³/ : 19.8...20.0

100 s: (19.5...20.3)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.2...6.8

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1400

Del.quantity : 198.0...200.0

1000 : (195.0...203.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600
Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.70
Speed rpm : 1145...1160
2nd rack travel in: 4.00
Speed rpm : 1220...1250
4th rack travel in: 1300
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.5

Testing:

Speed rpm : 200
Minimum rack trave: 8.30
Speed rpm : 300
Rack travel in mm : 6.40...6.60
Rack travel in mm : 2.00
Speed rpm : 370...410

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : -
Rack travel mm : 11.80...12.10

Measurement

Speed 1/min : 500

1st pressure hPa : 600
Rack travel in m: 12.30...12.40
2nd pressure hPa : 950
Rack travel in m: 13.00...13.20

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400
Speed rpm : 800
Del.quantity cm³/ : 201.0...205.0
1000 s: (198.0...208.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm³/ : 144.0...146.0
1000 s: (141.0...149.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 12.70
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 200.0...220.0
1000 s: (196.0...224.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 23.10.92
 Replaces : 06.92
 Test oil : ISO-4113
 Combination no. : 0 402 746 919X

Injection pump
 Pump designation : PES6P120A720LS7237
 -10
 EP type number : 0 412 726 872
 Governor
 Governor design. : RQ300/1100PA1013-1
 Governor no. : 0 421 801 603
 Cust. part no. : 0220743402

TEST BENCH REQUIREMENTS

Customer-spec. information
 Customer : MERCEDES-BENZ
 Engine : OM447 HA
 1st version kW : 184.0
 Rated speed : 2200

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm: 20.00...21.00
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.70...13.90

Del. quantity cm³/ : 20.3...20.5

100 s: (20.0...20.8)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0
 Rack travel in mm : 6.2...6.8
 Del. quantity cm³/ : 1.6...2.2
 100 s: (1.3...2.5)
 Spread cm³ : 0.8
 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -2
 Speed rpm : 600
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1100
 Aneroid pressure h: 1400
 Del. quantity : 203.0...205.0
 1000 : (200.0...208.0)
 Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600
Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.80
Speed rpm : 1145...1160
2nd rack travel in: 4.00
Speed rpm : 1220...1250
4th rack travel in: 1300
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.5

Testing:

Speed rpm : 200
Minimum rack travel: 8.30
Speed rpm : 300
Rack travel in mm : 6.40...6.60
Rack travel in mm : 2.00
Speed rpm : 370...410

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : -
Rack travel mm : 11.80...12.10

Measurement

Speed 1/min : 500

1st pressure hPa : 600
Rack travel in m: 12.40...12.50
2nd pressure hPa : 950
Rack travel in m: 13.10...13.30

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 144.0...146.0
1000 s: (141.0...149.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.80
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 200.0...220.0
1000 s: (196.0...224.0)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 23.10.92
 Replaces : 06.92
 Test oil : ISO-4113

Combination no. : 0 402 746 923X

Injection pump
 Pump designation : PES6P120A720LS7237-1
 EP type number : 0 412 726 872
 Governor
 Governor design. : RQ300/1100PA1013-2
 Governor no. : 0 421 801 611

Cust. part no. : 0220743502

Customer-spec. information
 Customer : MERCEDES-BENZ

Engine : OM447 hA

1st version kW : 184.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow
 quantity min. 1/h: 100...120

Test nozzle holder
 assembly : 1 688 901 105

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 20.00...21.00
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.60...13.80

Del.quantity cm³/ : 19.8...20.0

100 s: (19.5...20.3)

Spread cm³ : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.2...6.8

Del.quantity cm³/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm³ : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1400

Del.quantity : 198.0...200.0

1000 : (195.0...203.0)

Spread cm³ : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600
Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.70
Speed rpm : 1145...1160
2nd rack travel in: 4.00
Speed rpm : 1220...1250
4th rack travel in: 1300
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.50

Testing:

Speed rpm : 200
Minimum rack travel: 8.30
Speed rpm : 300
Rack travel in mm : 6.40...6.60
Rack travel in mm : 2.00
Speed rpm : 370...410

Aneroid/Altitude
Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : -
Rack travel mm : 11.80...12.10

Measurement

Speed 1/min : 500

1st pressure hPa : 600
Rack travel in m: 12.30...12.40
2nd pressure hPa : 950
Rack travel in m: 13.00...13.20

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400
Speed rpm : 800
Del.quantity cm³/ : 201.0...205.0
1000 s: (198.0...208.0)
Spread cm³ : 8.00
1000 s: (12.0)
Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm³/ : 144.0...146.0
1000 s: (141.0...149.0)
Spread cm³ : 8.00
1000 s: (12.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 12.70
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 200.0...220.0
1000 s: (196.0...224.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PER
 Edition : 27.11.92
 Replaces : 10.92
 Test oil : ISO-4113
 Combination no. : 0 402 746 934
 Injection pump
 Pump designation : PES6P120A320RS7256
 EP type number : 0 412 726 879
 Governor
 Governor design. : RGV25Q...950PA793-3
 Governor no. : 0 421 814 014

Customer-spec. information
 Customer : PERKINS

Engine : EAGLE TX 375/400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 1 688 901 019
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,8
 Test lines : 1 680 750 075
 Outside diameter
 x wall thickness
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 4.50...4.60
 : (4.45...4.65)
 Rack travel in mm : 12.00...13.00

Firing order : 1- 4- 2- 6- 3- 5

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900
 Rack travel in mm : 12.20...12.30
 Del. quantity cm³/ : 26.2...26.4
 100 s: (25.9...26.7)
 Spread cm³ : 0.6
 100 s: (0.9)
 2nd speed rpm : 250.0
 Rack travel in mm : 4.3...4.5
 Del. quantity cm³/ : 2.1...2.5
 100 s: (1.8...2.8)
 Spread cm³ : 0.8
 100 s: (1.2)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250
 travel mm : 0.90...1.40
 2nd speed rpm : 315
 travel mm : 1.70...2.20
 3rd speed rpm : 670
 travel mm : 3.90...4.40
 4th speed rpm : 985
 travel mm : 7.60...7.80
 5th speed rpm : 1250
 travel mm : 11.00...12.00

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1115
 Rack travel in mm : 10.00...12.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 900
 Aneroid pressure h: 1200
 Del. quantity : 262.0...264.0
 1000 : (259.0...267.0)

Spread cm³ : 6.00
1000 : (9.00)

RATED SPEED

1st version
Control lever
position degrees: 113...121

Testing:
1st rack travel in: 11.30
Speed rpm : 980...990
2nd rack travel in: 4.00
Speed rpm : 1055...1085
4th rack travel in: 1200
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 80...88

Testing:
Speed rpm : 100
Minimum rack travel: 7.50
Speed rpm : 250
Rack travel in mm : 4.30...4.50

CONSTANT REGULATION
Speed rpm : 250...450

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 600
Pressure hPa : 1200
Rack travel mm : 12.20...12.30

Measurement
Speed 1/min : 600

1st pressure hPa : -
Rack travel in m: 8.20...8.40
2nd pressure hPa : 515
Rack travel in m: 11.10...11.20
3rd pressure hPa : 300
Rack travel in m: 9.10...9.30

START CUT-OUT

Speed 1/min : 170 (190)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: -
Speed rpm : 600

Del.quantity cm³/ : 142.0...144.0
1000 s : (139.0...147.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.30
Speed rpm : 980...990

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 190.0...230.0
1000 s : (187.0...233.0)
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 4.30...4.50
Del.quantity cm³/ : 21.0...25.0
1000 s : (18.0...28.0)
Spread cm³ : 8.00
1000 s : (12.00)

Remarks:

Delivery-valve spring pre-tension
3.2...3.4 mm.
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring
preload on new delivery-valve holders
to 2.9...3.1 mm.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : UNI
 Edition : 27.11.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 746 937
 Injection pump
 Pump designation : PES6P120A72DRS7268
 EP type number : 0 412 726 884
 Governor
 Governor design. : RQ275/1100PA915-2
 Governor no. : 0 421 801 671

Customer-spec. information
 Customer : IVECO-UNIC

Engine : 8460.41.603

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 1 688 901 105
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,8
 Test lines : 1 680 750 015
 Outside diameter
 x Wall thickness
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27
 Prestroke mm : 5.10...5.20
 : (5.05...5.25)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100
 Rack travel in mm : 11.50...11.60
 Del. quantity cm³/ : 18.3...18.5
 100 s : (18.0...18.8)
 Spread cm³ : 0.5
 100 s : (0.9)

2nd speed rpm : 275.0
 Rack travel in mm : 5.0...5.4
 Del. quantity cm³/ : 2.0...2.6
 100 s : (1.7...2.9)
 Spread cm³ : 0.8
 100 s : (1.2)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -2
 Speed rpm : 600
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1100
 Aneroid pressure h: 900
 Del. quantity : 183.0...185.0
 1000 : (180.0...188.0)
 Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
 Setting point:
 Speed rpm : 600
 Rack travel in mm : 20.0

Testing:
 1st rack travel in: 10.50
 Speed rpm : 1145...1160
 2nd rack travel in: 4.00
 Speed rpm : 1230...1260

4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 275
Rack travel in mm : 5.2

Testing:

Speed rpm : 100
Minimum rack travel: 6.70
Speed rpm : 275
Rack travel in mm : 5.10...5.30
Rack travel in mm : 2.00
Speed rpm : 325...365

TORQUE CONTROL

Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 1100
Rack travel in m: 12.00...12.10
2nd speed rpm : 550
Rack travel in m: 12.00...12.20

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 11.50...11.60

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 8.70...8.90
2nd pressure hPa : 310
Rack travel in m: 10.80...10.90
3rd pressure hPa : 240
Rack travel in m: 9.30...9.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 550
Del.quantity cm3/ : 195.0...201.0
1000 s: (192.0...204.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 104.0...106.0
1000 s: (101.0...109.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.50
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 115.0...145.0
1000 s: (111.0...149.0)

LOW IDLE

Speed rpm : 275
Rack travel in mm : 5.00...5.40
Del.quantity cm3/ : 20.0...26.0
1000 s: (17.0...29.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : UNI
 Edition : 27.11.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 746 938
 Injection pump
 Pump designation : PES6P120A72ORS7269
 EP type number : 0 412 726 885
 Governor
 Governor design. : RQ310/1025PA872-1
 Governor no. : 0 421 801 672

Customer-spec. information
 Customer : IVECO-UNIC

Engine : 8460.21.313

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42
 Overflow valve : 1 417 413 025
 Inlet press., bar : 1.50
 Test nozzle holder assembly : 1 688 901 105
 Opening pressure, bar : 207...210
 Orifice plate diameter mm : 0,8
 Test lines : 1 680 750 015
 Outside diameter x Wall thickness x Length mm : 6.00x1.50x600
 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 5.10...5.20
 : (5.05...5.25)
 Rack travel in mm : 12.00...13.00

Firing order : 1- 5- 3- 6- 2- 4
 Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.40...5.60
 & maximum rack tra: 12.0...13.0
 Difference ° CS : 2.00...4.00

BASIC SETTING

1st speed rpm : 1025
 Rack travel in mm : 12.60...12.70
 Del.quantity cm³/ : 19.2...19.4
 100 s: (18.9...19.7)
 Spread cm³ : 0.5
 100 s: (0.9)
 2nd speed rpm : 310.0
 Rack travel in mm : 5.7...6.1
 Del.quantity cm³/ : 2.0...2.6
 100 s: (1.7...2.9)
 Spread cm³ : 0.8
 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -2
 Speed rpm : 600
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1025
 Aneroid pressure h: 900
 Del.quantity : 192.0...194.0
 1000 : (189.0...197.0)
 Spread cm³ : 5.00
 1000 : (9.00)

RATED SPEED

1st version
 Setting point:
 Speed rpm : 600
 Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.60
Speed rpm : 1070...1085
2nd rack travel in: 4.00
Speed rpm : 1135...1165
4th rack travel in: 1350
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 310
Rack travel in mm : 5.8

Testing:

Speed rpm : 100
Minimum rack travel: 7.30
Speed rpm : 310
Rack travel in mm : 5.70...5.90
Rack travel in mm : 2.00
Speed rpm : 335...375

TORQUE CONTROL

Dimension a mm : -
Torque control curve - 1st version
1st speed rpm : 1025
Rack travel in m: 13.10...13.20
2nd speed rpm : 550
Rack travel in m: 13.10...13.30

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 12.60...12.70

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.80...10.00
2nd pressure hPa : 310
Rack travel in m: 11.90...12.00
3rd pressure hPa : 240
Rack travel in m: 10.50...10.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 550
Del.quantity cm3/ : 210.0...216.0
1000 s: (207.0...219.0)
Aneroid pressure h: -
Speed rpm : 500

Del.quantity cm3/ : 123.0...125.0
1000 s: (120.0...128.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.60
Speed rpm : 1070...1085

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 105.0...135.0
1000 s: (101.0...139.0)

LOW IDLE

Speed rpm : 310
Rack travel in mm : 5.70...6.10
Del.quantity cm3/ : 20.0...26.0
1000 s: (17.0...29.0)
Spread cm3 : 8.00
1000 s: (12.00)

Remarks:

Setting and blocking of pointer of
start-of-delivery sensor on cyl. 1
start of delivery

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,
the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PEN
 Edition : 23.10.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 402 846 054
 Injection pump
 Pump designation : PE6P120A32ORS8017
 EP type number : 0 412 826 018
 Governor
 Governor design. : RGV300...1100PA1017
 -1
 Governor no. : 0 421 814 023

Customer-spec. information
 Customer : PENTA

Engine : TWD 1030 ME

1st version kW : 212.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 2 417 413 078
 Inlet press., bar : 2.50
 Test nozzle holder
 assembly : 1 688 901 103
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,7
 Test lines : 1 680 750 008
 Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600
 (A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 25...27

Prestroke mm : 4.10...4.20
 : (4.05...4.25)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.30 (0.75)
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700
 Rack travel in mm : 11.00...11.10
 Del. quantity cm³/ : 21.0...21.2
 100 s: (20.7...21.5)
 Spread cm³ : 0.6
 100 s: (1.0)
 2nd speed rpm : 300.0
 Rack travel in mm : 4.3...4.5
 Del. quantity cm³/ : 1.7...2.3
 100 s: (1.5...2.5)
 Spread cm³ : 0.7
 100 s: (1.1)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL
 1st speed rpm : 300
 travel mm : 0.90...1.30
 2nd speed rpm : 500
 travel mm : 2.60...3.20
 3rd speed rpm : 800
 travel mm : 4.90...5.50
 4th speed rpm : 1150
 travel mm : 8.20...8.40
 5th speed rpm : 1300
 travel mm : 10.10...10.50

GUIDE SLEEVE POSITION
 Control-lever position
 Degree: -1
 Speed rpm : 1160
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700

Aneroid pressure h: 1200
Del.quantity : 210.0...212.0
1000 : (207.0...215.0)
Spread cm3 : 6.00
1000 : (10.00)

RATED SPEED

1st version
Control lever
position degrees: 110...118

Testing:
1st rack travel in: 10.00
Speed rpm : 1120...1130
2nd rack travel in: 4.00
Speed rpm : 1190...1220
4th rack travel in: 1320
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 78...86

Testing:
Speed rpm : 100
Minimum rack travel: 5.90
Speed rpm : 300
Rack travel in mm : 4.30...4.50

CONSTANT REGULATION
Speed rpm : 300...360

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 1200
Rack travel mm : 11.00...11.10

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 7.60...7.80
2nd pressure hPa : 260
Rack travel in m: 7.80...7.90 *

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1200
Speed rpm : 1100
Del.quantity cm3/ : 179.0...185.0
1000 s: (176.0...188.0)

Spread cm3 : 10.00
1000 s: (14.0)
Aneroid pressure h: -
Speed rpm : 700
Del.quantity cm3/ : 130.5...132.5
1000 s: (127.5...135.5)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.00
Speed rpm : 1120...1130

Remarks:

* Increase in control-rod travel with
respect to setting at least 0.1 mm

APPLICATION

Ship

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 21.09.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 244 030
 Injection pump
 Pump designation : PES4MW100/72ORS1513
 EP type number : 0 413 204 011
 Governor
 Governor design. : RQV300...1300MW119
 Governor no. : 0 420 083 251

Customer-spec. information
 Customer : MB-NFZ

Engine : OM364LA

1st version kW : 102.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 419 992 198
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 0 681 343 009
 Opening
 pressure, bar : 172...175
 Test lines : 1 680 750 089
 Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32
 Prestroke mm : 5.20...5.30
 : (5.15...5.35)
 Rack travel in mm : 21.00...0.00

K02

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300
 Rack travel in mm : 12.80...12.90
 Del.quantity cm³/ : 11.8...12.0
 100 s: (11.6...12.2)
 Spread cm³ : 0.3
 100 s: (0.6)
 2nd speed rpm : 300.0
 Rack travel in mm : 4.2...4.4
 Del.quantity cm³/ : 1.0...1.4
 100 s: (0.7...1.6)
 Spread cm³ : 0.3
 100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350
 travel mm : 8.40...8.80
 2nd speed rpm : 880
 travel mm : 4.90...5.10
 3rd speed rpm : 500
 travel mm : 2.70...3.30
 4th speed rpm : 300
 travel mm : 1.20...1.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1300
 Aneroid pressure h: 1000
 Del.quantity : 118.0...120.0
 1000 : (116.0...122.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Testing:
 1st rack travel in: 11.80
 Speed rpm : 1340...1350
 2nd rack tra ! in: 4.00

Speed rpm : 1455...1485
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 69...77
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 4.3

Testing:

Speed rpm : 200
Minimum rack travel: 6.00
Speed rpm : 300
Rack travel in mm : 4.20...4.40

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 7.90...8.00

Measurement

Speed 1/min : 500

1st pressure hPa : 200
Rack travel in m: 8.70...8.90
2nd pressure hPa : 500
Rack travel in m: 10.90...11.00
3rd pressure hPa : 1000
Rack travel in m: 12.80...12.90

START CUT-OUT

Speed 1/min : 200 (230)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 600
Del.quantity cm³/ : 115.0...118.0
1000 s: (112.5...120.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 47.5...49.5
1000 s: (45.5...51.5)

BREAKAWAY

1st version

K03

1mm rack travel less than

full load rack tr: 11.80
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 115.0...125.0
1000 s: (112.0...128.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 4.20...4.40
Del.quantity cm³/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 F 1
 Edition : 27.11.92
 Replaces : 04.90
 Test oil : ISO-4113
 Combination no. : 0 403 436 105
 Injection pump
 Pump designation : PES6MW100/120RS1169
 EP type number : 0 413 406 153
 Governor
 Governor design. : RQV350...1200MW78-1
 Governor no. : 0 420 083 156

Customer-spec. information
 Customer : CDC

Engine : 6CTA830

1st version kW : 197.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 1 688 901 017
 Opening
 pressure, bar : 207...210
 Test lines : 1 680 750 008
 Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10
 : (2.95...3.15)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1200
 Rack travel in mm : 11.90...12.00
 Del. quantity cm³/ : 14.1...14.3
 100 s: (13.9...14.5)
 Spread cm³ : 0.3
 100 s: (0.6)
 2nd speed rpm : 350.0
 Rack travel in mm : 5.6...5.8
 Del. quantity cm³/ : 1.6...2.0
 100 s: (1.4...2.2)
 Spread cm³ : 0.3
 100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350
 travel mm : 8.60...9.00
 2nd speed rpm : 1250
 travel mm : 7.60...7.80
 3rd speed rpm : 800
 travel mm : 4.90...5.50
 4th speed rpm : 350
 travel mm : 1.20...1.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1200
 Aneroid pressure h: 600
 Del. quantity : 141.0...143.0
 1000 : (139.0...145.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 42...50

Testing:
 1st rack travel in: 10.90
 Speed rpm : 1240...1250
 2nd rack travel in: 4.00
 Speed rpm : 1385...1415

4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position: degrees: 10...18
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.7

Testing:

Speed rpm : 100
Minimum rack travel: 7.50
Speed rpm : 350
Rack travel in mm : 5.60...5.80

CONSTANT REGULATION

Speed rpm : 370...500

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 345
Rack travel mm : 10.40...10.50

Measurement

Speed 1/min : 500

1st pressure hPa : 600
Rack travel in m: 11.90...12.00
2nd pressure hPa : -
Rack travel in m: 10.00...10.20
3rd pressure hPa : 500
Rack travel in m: 11.60...11.90

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 600
Speed rpm : 750
Del.quantity cm³/ : 137.5...141.5
1000 s: (135.0...143.0)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 101.0...103.0
1000 s: (99.0...105.0)
Spread cm³ : 3.50
1000 s: (6.00)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 10.90
Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 218.0...228.0
1000 s: (215.0...231.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.60...5.80
Del.quantity cm³/ : 16.0...20.0
1000 s: (14.0...22.0)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

Start-of-delivery mark 10.5° cam angle
after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PER
 Edition : 23.10.92
 Replaces : 09.92
 Test oil : ISO-4113
 Combination no. : 0 403 436 114
 Injection pump
 Pump designation : PES6MW100/320/3RS119
 4-1
 EP type number : 0 413 406 221
 Governor
 Governor design. : RQV300...1300MW108K
 Governor no. : 0 420 083 998

Customer-spec. information

Customer : PERKINS

Engine : 180 TI

1st version kW : 134.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.30...3.40
 : (3.25...3.45)
 Rack travel in mm : 12.00...14.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 14.30...14.40

Del.quantity cm³/ : 13.4...13.6

100 s: (13.2...13.8)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.1...6.3

Del.quantity cm³/ : 1.4...1.8

100 s: (1.1...2.0)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 10.00...10.40

2nd speed rpm : 900

travel mm : 6.40...6.60

3rd speed rpm : 480

travel mm : 3.10...3.70

4th speed rpm : 300

travel mm : 1.40...1.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1380

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 900

Del.quantity : 134.0...136.0
1000 : (132.0...138.0)
Spread cm³ : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 118...126

Setting point:
Speed rpm : 1380
Rack travel in mm : 16,5

Testing:
1st rack travel in: 13.30
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1480...1510
4th rack travel in: 1600
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.2

Testing:
Speed rpm : 200
Minimum rack travel: 7.50
Speed rpm : 300
Rack travel in mm : 6.10...6.30

CONSTANT REGULATION

Speed rpm : 330...500

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1300
Rack travel in m: 14.30...14.40
2nd speed rpm : 800
Rack travel in m: 13.10...13.30
3rd speed rpm : 500
Rack travel in m: 11.70...11.90
4th speed rpm : 1000
Rack travel in m: 13.60...13.90
5th speed rpm : 700
Rack travel in m: 12.60...12.90

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 1300
Pressure hPa : -

K07

Rack travel mm : 9.20...9.40

Measurement
Speed 1/min : 1300

1st pressure hPa : 180
Rack travel in m: 10.40...10.50
2nd pressure hPa : 220
Rack travel in m: 10.90...11.20
3rd pressure hPa : 900
Rack travel in m: 11.70...11.90

START CUT-OUT

Speed 1/min : 240 (250)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 800
Del.quantity cm³/ : 126.0...129.0
1000 s: (123.5...131.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 61.0...63.0
1000 s: (59.0...65.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.30
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 78.0...92.0
1000 s: (75.0...95.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.10...6.30
Del.quantity cm³/ : 14.0...18.0
1000 s: (11.5...20.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

Start-of-delivery blocking 46.5°
before start of delivery of cylinder 1



BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PER 5,8 D
 Edition : 23.10.92
 Replaces : 04.92
 Test oil : ISO-4113
 Combination no. : 0 403 444 119
 Injection pump
 Pump designation : PES4MW100/32ORS1199
 EF type number : 0 413 404 112
 Governor
 Governor design. : RQV300...1300MW110K
 Governor no. : 0 420 083 996

Customer-spec. information
 Customer : PERKINS

Engine : 110 TI

1st version kW : 82.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 419 992 198
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 1 688 901 101
 Opening
 pressure, bar : 207...210
 Orifice plate
 diameter mm : 0,6
 Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.30...3.40
 : (3.25...3.45)
 Rack travel in mm : 12.00...14.00
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1300
 Rack travel in mm : 13.00...13.10

Del.quantity cm3/ : 12.4...12.6
 100 s: (12.2...12.8)

Spread cm3 : 0.3
 100 s: (0.6)

2nd speed rpm : 300.0
 Rack travel in mm : 6.1...6.3
 Del.quantity cm3/ : 1.6...2.0
 100 s: (1.3...2.2)
 Spread cm3 : 0.3
 100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350
 travel mm : 10.00...10.40
 2nd speed rpm : 900
 travel mm : 6.40...6.60
 3rd speed rpm : 480
 travel mm : 3.10...3.70
 4th speed rpm : 300
 travel mm : 1.40...1.80

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1380
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1300
 Aneroid pressure h: 900
 Del.quantity : 124.0...126.0
 1000 : (122.0...128.0)

Spread cm³ : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 116...124

Setting point:
Speed rpm : 1380
Rack travel in mm : 16.5

Testing:
1st rack travel in: 12.00
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1450...1480
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 66...74
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.2

Testing:
Speed rpm : 200
Minimum rack travel: 7.50
Speed rpm : 300
Rack travel in mm : 6.10...6.30

CONSTANT REGULATION
Speed rpm : 330...500

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1300
Rack travel in m: 13.00...13.10
2nd speed rpm : 800
Rack travel in m: 12.00...12.20
3rd speed rpm : 500
Rack travel in m: 10.30...10.50
4th speed rpm : 1000
Rack travel in m: 12.40...12.70
5th speed rpm : 400
Rack travel in m: 9.90...10.20

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 1300
Pressure hPa : -
Rack travel mm : 9.20...9.40

Measurement
Speed 1/min : 1300

1st pressure hPa : 100
Rack travel in m: 9.80...9.90
2nd pressure hPa : 150
Rack travel in m: 10.80...11.10
3rd pressure hPa : 900
Rack travel in m: 13.00...13.10

START CUT-OUT

Speed 1/min : 240 (250)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 800
Del.quantity cm³/ : 118.0...121.0
1000 s: (115.5...123.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 61.0...63.0
1000 s: (59.0...65.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 12.00
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 78.0...92.0
1000 s: (75.0...95.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.10...6.30
Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

Start-of-delivery blocking 46.5°
before start of delivery of cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 4,0 H
 Edition : 21.09.92
 Replaces : 02.91
 Test oil : ISO-4113

Combination no. : 0 403 444 122

Injection pump
 Pump designation : PES4MW100/720RS1151
 EP type number : 0 413 404 104
 Governor
 Governor design. : RQV300...1200MW50-14
 Governor no. : 0 420 083 239

Customer-spec. information
 Customer : MB-NFZ

Engine : OM364A

1st version kW : 77.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)
 Rack travel in mm : 9.00...12.00

K12

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.80...10.90

Del.quantity cm³/ : 8.6...8.8

100 s: (8.4...9.0)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.5

Del.quantity cm³/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.50...8.90

2nd speed rpm : 1250

travel mm : 7.60...7.80

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1200
 Aneroid pressure h: 700
 Del.quantity : 86.0...88.0
 1000 : (84.0...90.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 105...113

Testing:
 1st rack travel in: 9.80

Speed rpm : 1250...1260
2nd rack travel in: 4.00
Speed rpm : 1350...1380
4th rack travel in: 1450
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 75...83
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.4

Testing:

Speed rpm : 200
Minimum rack travel: 8.00
Speed rpm : 300
Rack travel in mm : 6.30...6.50

TORQUE CONTROL

Dimension a mm : 0.70
Torque control curve - 1st version
1st speed rpm : 1200
Rack travel in m: 10.80...10.90
2nd speed rpm : 600
Rack travel in m: 11.50...11.60
3rd speed rpm : 1100
Rack travel in m: 11.00...11.30

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.70...9.80

Measurement

Speed 1/min : 500

1st pressure hPa : 300
Rack travel in m: 10.00...10.20
2nd pressure hPa : 450
Rack travel in m: 11.20...11.40
3rd pressure hPa : 700
Rack travel in m: 11.50...11.60

START CUT-OUT

Speed 1/min : 200 (230)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 600

Del.quantity cm³/ : 79.0...82.0
1000 s: (76.5...84.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 49.0...51.0
1000 s: (47.0...53.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.80
Speed rpm : 1250...1260

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 78.0...88.0
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.30...6.50
Del.quantity cm³/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 25.09.92
 Replaces : 07.92
 Test oil : ISO-4113
 Combination no. : 0 403 444 140
 Injection pump
 Pump designation : PES4MW100/72ORS1151
 EP type number : 0 413 404 104
 Governor
 Governor design. : RQV300...1200MW50-30
 Governor no. : 0 420 083 283

Customer-spec. information
 Customer : MB-NFZ

Engine : OM364A

1st version kW : 77.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1-3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.80...10.90

Del. quantity cm³/ : 8.6...8.8

100 s: (8.4...9.0)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.7...5.9

Del. quantity cm³/ : 1.9...1.4

100 s: (0.7...1.6)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.50...8.90

2nd speed rpm : 1250

travel mm : 7.60...7.80

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 700

Del. quantity : 86.0...88.0

1000 : (84.0...90.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 105...113

Testing:

1st rack travel in: 9.80

Speed rpm : 1250...1260
2nd rack travel in: 4.00
Speed rpm : 1350...1380
4th rack travel in: 1450
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 72...80
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.8

Testing:

Speed rpm : 200
Minimum rack travel: 7.30
Speed rpm : 300
Rack travel in mm : 5.70...5.90

TORQUE CONTROL

Dimension a mm : 0.70
Torque control curve - 1st version
1st speed rpm : 1200
Rack travel in m: 10.80...10.90
2nd speed rpm : 600
Rack travel in m: 11.50...11.60
3rd speed rpm : 1100
Rack travel in m: 11.00...11.30

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.50...9.70

Measurement

Speed 1/min : 500
1st pressure hPa : 300
Rack travel in m: 10.00...10.20
2nd pressure hPa : 450
Rack travel in m: 11.20...11.40
3rd pressure hPa : 700
Rack travel in m: 11.50...11.60

START CUT-OUT

Speed 1/min : 200 (230)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 600

Del.quantity cm³/ : 79.0...82.0
1000 s: (76.5...84.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 49.0...51.0
1000 s: (47.0...53.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.80
Speed rpm : 1250...1260

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 78.0...88.0
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 5.70...5.90
Del.quantity cm³/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 03.12.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 444 141
 Injection pump
 Pump designation : PES4MW100/72ORS1151
 EP type number : 0 413 404 104
 Governor
 Governor design. : RQV300...1300MW50-16
 Governor no. : 0 420 083 240

Customer-spec. information
 Customer : MB-NFZ

Engine : OM364A

1st version kW : 79.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.80...10.90

Del.quantity cm³/ : 8.2...8.4

100 s: (8.0...8.6)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.2

Del.quantity cm³/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.40...8.80

2nd speed rpm : 880

travel mm : 4.90...5.10

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 82.0...84.0

1000 : (80.0...86.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 108...116

Testing:

1st rack travel in: 9.80

Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1420...1450
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 74...32
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.1

Testing:

Speed rpm : 200
Minimum rack travel: 8.00
Speed rpm : 300
Rack travel in mm : 6.00...6.20
Rack travel in mm : 2.00
Speed rpm : 480...540

TORQUE CONTROL

Dimension a mm : 0.80
Torque control curve - 1st version
1st speed rpm : 1300
Rack travel in m: 10.80...10.90
2nd speed rpm : 600
Rack travel in m: 11.60...11.70
3rd speed rpm : 1000
Rack travel in m: 11.60...11.70
4th speed rpm : 1175
Rack travel in m: 11.30...11.50

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.70...9.80

Measurement

Speed 1/min : 500

1st pressure hPa : 150
Rack travel in m: 10.30...10.50
2nd pressure hPa : 300
Rack travel in m: 11.30...11.50
3rd pressure hPa : 700
Rack travel in m: 11.60...11.70

START CUT-OUT

Speed 1/min : 200 (230)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 600
Del.quantity cm³/ : 75.0...78.0
1000 s: (72.5...80.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 46.0...48.0
1000 s: (44.0...50.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 9.80
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 78.0...88.0
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.00...6.20
Del.quantity cm³/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 444 142
 Injection pump
 Pump designation : PES4MW100/72ORS1212
 EP type number : 0 413 404 114
 Governor
 Governor design. : RQV300...1300MW50-15
 Governor no. : 0 420 083 238

Customer-spec. information
 Customer : MB-NFZ

Engine : OM364LA

1st version kW : 102.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 419 992 198
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 0 681 343 009
 Opening
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32
 Prestroke mm : 3.70...3.80
 : (3.65...3.85)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300
 Rack travel in mm : 13.20...13.30
 Del.quantity cm³/ : 10.1...10.3
 100 s: (9.9...10.5)
 Spread cm³ : 0.3
 100 s: (0.6)
 2nd speed rpm : 300.0
 Rack travel in mm : 6.4...6.6
 Del.quantity cm³/ : 1.0...1.4
 100 s: (0.7...1.6)
 Spread cm³ : 0.3
 100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450
 travel mm : 9.50...9.90
 2nd speed rpm : 1340
 travel mm : 8.50...8.70
 3rd speed rpm : 500
 travel mm : 2.70...3.30
 4th speed rpm : 300
 travel mm : 1.30...1.70

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -1
 Speed rpm : 1340
 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1300
 Aneroid pressure h: 700
 Del.quantity : 101.0...103.0
 1000 : (99.0...105.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 107...115

Testing:

1st rack travel in: 12.20
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1445...1475
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever
position degrees: 72...80
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.5

Testing:

Speed rpm : 200
Minimum rack travel: 8.00
Speed rpm : 300
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 320...550

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.10...10.20

Measurement

Speed 1/min : 500

1st pressure hPa : 200
Rack travel in m: 10.90...11.10
2nd pressure hPa : 400
Rack travel in m: 12.60...12.80
3rd pressure hPa : 700
Rack travel in m: 13.20...13.30

START CUT-OUT

Speed 1/min : 200 (230)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 600
Del.quantity cm³/ : 86.0...89.0
1000 s: (83.5...91.5)

Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 36.0...38.0
1000 s: (34.0...40.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 12.20
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 85.0...95.0
1000 s: (82.0...98.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.40...6.60
Del.quantity cm³/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 27.11.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 444 143
 Injection pump
 Pump designation : PES4MW100/72ORS1151
 EP type number : 0 413 404 104
 Governor
 Governor design. : RQV300...1200MW50-14
 Governor no. : 0 420 083 239

Customer-spec. information
 Customer : MB-NFZ

Engine : OM364A

1st version kW : 77.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00

K20

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.80...10.90

Del. quantity cm³/ : 8.6...8.8

100 s: (8.4...9.0)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.5

Del. quantity cm³/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.50...8.90

2nd speed rpm : 1250

travel mm : 7.60...7.80

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 700

Del. quantity : 86.0...88.0

1000 : (84.0...90.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 105...113

Testing:

1st rack travel in: 9.80

Speed rpm : 1250...1260
2nd rack travel in: 4.00
Speed rpm : 1350...1380
4th rack travel in: 1450
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 75...83
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.4

Testing:

Speed rpm : 200
Minimum rack travel: 8.00
Speed rpm : 300
Rack travel in mm : 6.30...6.50

TORQUE CONTROL

Dimension a mm : 0.70
Torque control curve - 1st version
1st speed rpm : 1200
Rack travel in m: 10.80...10.90
2nd speed rpm : 600
Rack travel in m: 11.50...11.60
3rd speed rpm : 1100
Rack travel in m: 11.00...11.30

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.70...9.80

Measurement

Speed 1/min : 500
1st pressure hPa : 300
Rack travel in m: 10.00...10.20
2nd pressure hPa : 450
Rack travel in m: 11.20...11.40
3rd pressure hPa : 700
Rack travel in m: 11.50...11.60

START CUT-OUT

Speed 1/min : 200 (230)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 600

Del.quantity cm³/ : 79.0...82.0
1000 s: (76.5...84.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 49.0...51.0
1000 s: (47.0...53.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.80
Speed rpm : 1250...1260

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 78.0...88.0
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.30...6.50
Del.quantity cm³/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
Edition : 03.12.92
Replaces : -
Test oil : ISO-4113

Combination no. : 0 403 444 144

Injection pump
Pump designation : PES4MW100/72ORS1151
EP type number : 0 413 404 104
Governor
Governor design. : RQV300...1300MW67-7
Governor no. : 0 420 083 278

Customer-spec. information
Customer : MB-NFZ

Engine : OM364A

1st version kW : 79.0
Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter
x Wall thickness
x Length mm : 6.00x1.50x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
: (3.65...3.85)
Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.80...10.90

Del. quantity cm³/ : 8.2...8.4

100 s: (8.0...8.6)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.5

Del. quantity cm³/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.40...8.80

2nd speed rpm : 880

travel mm : 4.90...5.10

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del. quantity : 82.0...84.0

1000 : (80.0...86.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 108...116

Testing:

1st rack travel in: 9.80
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1420...1450
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 74...82
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.4

Testing:

Speed rpm : 200
Minimum rack travel: 8.00
Speed rpm : 300
Rack travel in mm : 6.30...6.50
Rack travel in mm : 2.00
Speed rpm : 480...540

TORQUE CONTROL

Dimension a mm : 0.80
Torque control curve - 1st version
1st speed rpm : 1300
Rack travel in m: 10.80...10.90
2nd speed rpm : 600
Rack travel in m: 11.60...11.70
3rd speed rpm : 1000
Rack travel in m: 11.60...11.70
4th speed rpm : 1175
Rack travel in m: 11.30...11.50

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.70...9.80

Measurement

Speed 1/min : 500
1st pressure hPa : 150
Rack travel in m: 10.30...10.50
2nd pressure hPa : 300
Rack travel in m: 11.30...11.50
3rd pressure hPa : 700
Rack travel in m: 11.60...11.70

START CUT-OUT

K23

Speed 1/min : 200 (230)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 600
Del.quantity cm³/ : 75.0...78.0
1000 s: (72.5...80.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 46.0...48.0
1000 s: (44.0...50.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 9.80
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 78.0...88.0
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.30...6.50
Del.quantity cm³/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : PER 10,0 S
 Edition : 23.10.92
 Replaces : 02.92
 Test oil : ISO-4113

Combination no. : 0 403 446 250

Injection pump
 Pump designation : PES6MW100/32ORS1194
 EP type number : 0 413 406 186
 Governor
 Governor design. : RGV300...1300MW108K
 Governor no. : 0 420 083 998

Customer-spec. information
 Customer : PERKINS

Engine : 180 TI

1st version kW : 134.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.30...3.40
 : (3.25...3.45)
 Rack travel in mm : 12.00...14.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 14.30...14.40

Del.quantity cm³/ : 13.4...13.6

100 s: (13.2...13.8)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.1...6.3

Del.quantity cm³/ : 1.4...1.8

100 s: (1.1...2.0)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 10.00...10.40

2nd speed rpm : 900

travel mm : 6.40...6.60

3rd speed rpm : 480

travel mm : 3.10...3.70

4th speed rpm : 300

travel mm : 1.40...1.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1380

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 900

Del.quantity : 134.0...136.0

1000 : (132.0...138.0)

Spread cm³ : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 118...126

Setting point:
Speed rpm : 1380
Rack travel in mm : 16.5

Testing:
1st rack travel in: 13.30
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1480...1510
4th rack travel in: 1600
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.2

Testing:
Speed rpm : 200
Minimum rack travel: 7.50
Speed rpm : 300
Rack travel in mm : 6.10...6.30

CONSTANT REGULATION
Speed rpm : 330...500

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1300
Rack travel in m: 14.30...14.40
2nd speed rpm : 800
Rack travel in m: 13.10...13.30
3rd speed rpm : 500
Rack travel in m: 11.70...11.90
4th speed rpm : 1000
Rack travel in m: 13.60...13.90
5th speed rpm : 700
Rack travel in m: 12.60...12.90

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 1300
Pressure hPa : -
Rack travel mm : 9.20...9.40

Measurement
Speed 1/min : 1300

1st pressure hPa : 180
Rack travel in m: 10.40...10.50
2nd pressure hPa : 220
Rack travel in m: 10.90...11.20
3rd pressure hPa : 900
Rack travel in m: 11.70...11.90

START CUT-OUT

Speed 1/min : 240 (250)

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 900
Speed rpm : 800
Del.quantity cm³/ : 126.0...129.0
1000 s: (123.5...131.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 61.0...63.0
1000 s: (59.0...65.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.30
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 78.0...92.0
1000 s: (75.0...95.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.10...6.30
Del.quantity cm³/ : 14.0...18.0
1000 s: (11.5...20.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

Start-of-delivery blocking 46.5°
before start of delivery of cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 25.09.92
 Replaces : 03.92
 Test oil : ISO-4113
 Combination no. : 0 403 446 302
 Injection pump
 Pump designation : PES6MW100/72ORS1131
 EP type number : 0 413 406 123
 Governor
 Governor design. : RGV300...1300MW50-24
 Governor no. : 0 420 083 270

Customer-spec. information
 Customer : MB-WFZ

Engine : OM 366 A

1st version kW : 121.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 419 992 198
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 0 681 343 009
 Opening
 pressure, bar : 172...175

Test lines : 1 680 715 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.75)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - " : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.90...11.00

Del.quantity cm³/ : 8.8.. 9.0

100 s : (8.6...9.2)

Spread cm³ : 0.3

100 s : (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.1...6.3

Del.quantity cm³/ : 1.0...1.4

100 s : (0.7...1.6)

Spread cm³ : 0.3

100 s : (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.40...10.00

2nd speed rpm : 1350

travel mm : 8.50...8.70

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 88.0...90.0

1000 : (86.0...92.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 108...116

Testing:
1st rack travel in: 9.90
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1425...1455
4th rack travel in: 1500
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 72...80
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.2

Testing:
Speed rpm : 200
Minimum rack travel: 8.00
Speed rpm : 300
Rack travel in mm : 6.10...6.30

TORQUE CONTROL
Dimension a mm : 0.70
Torque control curve - 1st version
1st speed rpm : 1300
Rack travel in m: 10.90...11.00
2nd speed rpm : 750
Rack travel in m: 11.60...11.70
3rd speed rpm : 1100
Rack travel in m: 11.10...11.30

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.80...9.90

Measurement
Speed 1/min : 500

1st pressure hPa : 200
Rack travel in m: 10.20...10.30
2nd pressure hPa : 300
Rack travel in m: 11.00...11.30
3rd pressure hPa : 700
Rack travel in m: 11.60...11.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

K28

1st version
Aneroid pressure h: 700
Speed rpm : 750
Del.quantity cm3/ : 86.0...89.0
1000 s: (83.5...91.5)
Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 49.0...51.0
1000 s: (47.0...53.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 9.90
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 100.0...110.0
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.10...6.30
Del.quantity cm3/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MWM 6,2 F
 Edition : 23.10.92
 Replaces : 08.92
 Test oil : ISO-4113
 Combination no. : 0 403 446 306
 Injection pump
 Pump designation : PES6MW100/720RS1131
 EP type number : 0 413 406 123
 Governor
 Governor design. : RGV300...1300MW67-6
 Governor no. : 0 420 083 274

Customer-spec. information
 Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 121.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 715 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)
 Rack travel in mm : 9.00...12.00

L01

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.50...10.60

Del.quantity cm³/ : 8.8...9.0

100 s: (8.6...9.2)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...5.8

Del.quantity cm³/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.50...9.90

2nd speed rpm : 1350

travel mm : 8.60...8.80

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 88.0...90.0

1000 : (86.0...92.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 116...124

Testing:
1st rack travel in: 9.50
Speed rpm : 1340...1350
2nd rack travel in: 4.00
Speed rpm : 1415...1445
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 69...77
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 5.7

Testing:
Speed rpm : 200
Minimum rack travel: 7.50
Speed rpm : 300
Rack travel in mm : 5.60...5.80

TORQUE CONTROL
Dimension a mm : 0.80
Torque control curve - 1st version
1st speed rpm : 1300
Rack travel in m: 10.50...10.60
2nd speed rpm : 850
Rack travel in m: 11.20...11.40
3rd speed rpm : 1100
Rack travel in m: 10.70...10.90

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.20...9.30

Measurement
Speed 1/min : 500

1st pressure hPa : 300
Rack travel in m: 9.70...9.90
2nd pressure hPa : 400
Rack travel in m: 10.40...10.60
3rd pressure hPa : 700
Rack travel in m: 11.20...11.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

L02

1st version
Aneroid pressure h: 700
Speed rpm : 850
Del.quantity cm³/ : 88.0...91.0
1000 s: (85.5...93.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 49.0...51.0
1000 s: (47.0...53.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 9.50
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 80.0...90.0
1000 s: (77.0...93.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 5.60...5.80
Del.quantity cm³/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF
 Edition : 27.11.92
 Replaces : -
 Test oil : ISO-4113

Combination no. : 0 403 446 314

Injection pump
 Pump designation : PES6MW100/320RS1227
 EP type number : 0 413 406 215
 Governor
 Governor design. : RQ325/1300MW129
 Governor no. : 0 420 082 070

Cust. part no. : 1249932

Customer-spec. information
 Customer : DAF

Engine : NS156L

1st version kW : 156.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

L03

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10
 : (2.95...3.15)
 Rack travel in mm : 14.00...15.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Phasing :
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1000
 Rack travel in mm : 13.10...13.20
 Del. quantity cm³/ : 10.8...11.0
 100 s: (10.6...11.2)
 Spread cm³ : 0.3
 100 s: (0.6)

2nd speed rpm : 325.0
 Rack travel in mm : 4.4...4.6
 Del. quantity cm³/ : 0.7...1.1
 100 s: (0.4...1.3)
 Spread cm³ : 0.3
 100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1360
 travel mm : 6.30...6.70
 2nd speed rpm : 1300
 travel mm : 5.90...6.10
 3rd speed rpm : 450
 travel mm : 3.50...4.10
 4th speed rpm : 325
 travel mm : 1.70...2.10

GUIDE SLEEVE POSITION

Control-lever position
 Degree: 108
 Speed rpm : 800
 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1000
 Aneroid pressure h: 1000
 Del. quantity : 108.5...110.5
 1000 : (106.5...112.5)

Spread cm³ : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 90...98

Setting point:

Speed rpm : 800
Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.10
Speed rpm : 1345...1360
2nd rack travel in: 4.00
Speed rpm : 1445...1475
4th rack travel in: 1550
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 325
Rack travel in mm : 4.5

Testing:

Speed rpm : 225
Minimum rack travel: 6.00
Speed rpm : 325
Rack travel in mm : 4.40...4.60

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 600
Pressure hPa : 1000
Rack travel mm : 13.10...13.20

Measurement

Speed 1/min : 600

1st pressure hPa : 500
Rack travel in m: 12.50...12.60
2nd pressure hPa : 290
Rack travel in m: 11.20...11.50
3rd pressure hPa : -
Rack travel in m: 10.30...10.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 1300

L04

Del.quantity cm³/ : 103.0...106.0
1000 s: (100.5...108.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 600
Del.quantity cm³/ : 63.0...65.0
1000 s: (61.0...67.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 12.10
Speed rpm : 1345...1360

LOW IDLE

Speed rpm : 325
Rack travel in mm : 4.40...4.60
Del.quantity cm³/ : 7.0...11.0
1000 s: (4.5...13.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN 7,3 D
 Edition : 03.12.92
 Replaces : MAN 7,3
 Test oil : ISO-4113

Combination no. : 0 403 456 115

Injection pump
 Pump designation : PES6MW100/321RS1215
 EP type number : 0 413 406 205
 Governor
 Governor design. : RQ250/1200MW84-7
 Governor no. : 0 420 082 055

Customer-spec. information
 Customer : MAN

Engine : D 0826 LUH 01

1st version kW : 199.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)

Rack travel in mm : 15.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 14.20...14.30

Del.quantity cm³/ : 17.5...17.7

100 s : (17.2...18.0)

Spread cm³ : 0.4

100 s : (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 6.8...7.2

Del.quantity cm³/ : 2.8...3.2

100 s : (2.5...3.4)

Spread cm³ : 0.3

100 s : (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1320
 travel mm : 9.30...9.70

2nd speed rpm : 1255
 travel mm : 6.50...6.70

3rd speed rpm : 360
 travel mm : 3.90...4.50

4th speed rpm : 250
 travel mm : 1.60...2.00

GUIDE SLEEVE POSITION

Control-lever position
 Degree: 108

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1400

Del.quantity : 175.0...177.0

1000 : (172.0...180.0)

Spread cm³ : 4.00

1000 : (7.00)

RATED SPEED

1st version
Control lever
position degrees: 91...99

Setting point:
Speed rpm : 600
Rack travel in mm : 20.0

Testing:
1st rack travel in: 13.20
Speed rpm : 1245...1260
2nd rack travel in: 4.00
Speed rpm : 1340...1370
4th rack travel in: 1450
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 67...75
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 7.0

Testing:
Speed rpm : 150
Minimum rack travel: 8.50
Speed rpm : 250
Rack travel in mm : 6.80...7.20

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 270
Rack travel mm : 9.30...9.40

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 9.00...9.10
2nd pressure hPa : 850
Rack travel in m: 12.00...12.30
3rd pressure hPa : 1400
Rack travel in m: 14.20...14.30

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1400
Speed rpm : 600
Del.quantity cm3/ : 182.0...186.0
1000 s: (179.0...189.0)

Spread cm3 : 6.00
1000 s: (7.0)
Aneroid pressure h: 1400
Speed rpm : 800
Del.quantity cm3/ : 175.0...179.0
1000 s: (172.0...182.0)
Aneroid pressure h: 1400
Speed rpm : 1200
Del.quantity cm3/ : 170.0...174.0
1000 s: (167.0...177.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 60.0...62.0
1000 s: (59.0...64.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 13.20
Speed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 60.0...80.0
1000 s: (57.0...83.0)

LOW IDLE

Speed rpm : 250
Rack travel in mm : 6.80...7.20
Del.quantity cm3/ : 28.0...32.0
1000 s: (25.5...34.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks: : MAN #3-7126

Start-of-delivery mark is at start of
delivery of cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN
 Edition : 21.08.92
 Replaces : 06.92
 Test oil : ISO-4113

Combination no. : 0 403 456 118

Injection pump
 Pump designation : PES6MW100/321RS1201
 EP type number : 0 413 406 190
 Governor
 Governor design. : RQV250...1200MW83-3
 Governor no. : 0 420 083 280

Customer-spec. information
 Customer : MAN

Engine : D 0826 LF08

1st version kW : 169.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 9.00...12.00

L07

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 13.20...13.30

Del. quantity cm³/ : 14.8...15.0

100 s : (14.5...15.3)

Spread cm³ : 0.3

100 s : (0.6)

2nd speed rpm : 250.0
 Rack travel in mm : 5.4...5.6
 Del. quantity cm³/ : 1.6...2.0
 100 s : (1.3...2.2)

Spread cm³ : 0.3
 100 s : (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1250
 travel mm : 10.50...10.60
 2nd speed rpm : 810
 travel mm : 5.90...6.10
 3rd speed rpm : 500
 travel mm : 3.70...4.30
 4th speed rpm : 250
 travel mm : 1.20...1.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 800
 Aneroid pressure h: 1000
 Del. quantity : 148.0...150.0
 1000 : (145.0...153.0)

Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 120...128

Testing:
1st rack travel in: 11.80
Speed rpm : 1245...1260
2nd rack travel in: 4.00
Speed rpm : 1320...1350
4th rack travel in: 14.00
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 5.5

Testing:
Speed rpm : 100
Minimum rack travel: 7.00
Speed rpm : 250
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION
Speed rpm : 330...420

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 800
Rack travel in m: 13.20...13.30
2nd speed rpm : 1200
Rack travel in m: 12.70...12.90
3rd speed rpm : 1000
Rack travel in m: 13.00...13.20
4th speed rpm : 600
Rack travel in m: 13.20...13.30

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 155
Rack travel mm : 10.30...10.40

Measurement
Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.00...10.10
2nd pressure hPa : 550
Rack travel in m: 11.90...12.20
3rd pressure hPa : 1000
Rack travel in m: 13.20...13.30

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000

L08

Speed rpm : 1200
Del.quantity cm3/ : 143.0...147.0
1000 s: (140.0...150.0)
Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: 1000
Speed rpm : 1000
Del.quantity cm3/ : 144.0...148.0
1000 s: (141.0...151.0)
Aneroid pressure h: 1000
Speed rpm : 600
Del.quantity cm3/ : 147.0...151.0
1000 s: (144.0...154.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 74.0...76.0
1000 s: (72.0...78.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.30
Speed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 60.0...80.0
1000 s: (57.0...83.0)

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.40...5.60
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:
: MAN #3-7218

Start-of-delivery mark is at start of
delivery of cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN
 Edition : 21.08.92
 Replaces : 06.92
 Test oil : ISO-4113
 Combination no. : 0 403 456 119
 Injection pump
 Pump designation : PES6MW100/321RS1201
 EP type number : 0 413 406 190
 Governor
 Governor design. : RQ250/1200MW84-10
 Governor no. : 0 420 082 065

Customer-spec. information
 Customer : MAN

Engine : D0826LF 08/LUH05

1st version kW : 169.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 15.00...0.00

L09

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 13.20...13.30

Del.quantity cm³/ : 14.8...15.0

100 s: (14.5...15.3)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del.quantity cm³/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm³ : 0.5

100 s: (0.7)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1300

travel mm : 8.40...8.80

2nd speed rpm : 1260

travel mm : 6.60...6.80

3rd speed rpm : 345

travel mm : 4.00...4.60

4th speed rpm : 250

travel mm : 1.80...2.20

GUIDE SLEEVE POSITION

Control-lever position

Degree: 107

Speed rpm : 600

Rack travel in mm : 18.20...19.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1000

Del.quantity : 148.0...150.0

1000 : (145.0...153.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 92...100

Setting point:
Speed rpm : 600
Rack travel in mm : 19.0

Testing:
1st rack travel in: 11.80
Speed rpm : 1245...1260
2nd rack travel in: 4.00
Speed rpm : 1300...1330
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 69...77
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 5.5

Testing:
Speed rpm : 100
Minimum rack travel: 7.00
Speed rpm : 250
Rack travel in mm : 5.40...5.60

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 800
Rack travel in m: 13.20...13.30
2nd speed rpm : 1200
Rack travel in m: 12.70...12.90
3rd speed rpm : 1000
Rack travel in m: 13.00...13.20
4th speed rpm : 600
Rack travel in m: 13.20...13.30

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 155
Rack travel mm : 10.30...10.40

Measurement
Speed 1/min : 500
1st pressure hPa : -
Rack travel in m: 10.00...10.10
2nd pressure hPa : 550
Rack travel in m: 11.90...12.20
3rd pressure hPa : 1000

Rack travel in m: 13.20...13.30

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000
Speed rpm : 1200
Del.quantity cm³/ : 143.0...147.0
1000 s: (140.0...150.0)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: 1000
Speed rpm : 1000
Del.quantity cm³/ : 144.0...148.0
1000 s: (141.0...151.0)
Aneroid pressure h: 1000
Speed rpm : 600
Del.quantity cm³/ : 147.0...151.0
1000 s: (144.0...154.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 74.0...76.0
1000 s: (72.0...78.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.80
Speed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 60.0...80.0
1000 s: (57.0...83.0)

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.40...5.60
Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 5.00
1000 s: (7.00)

Remarks:

: MAN #3-7219

Start-of-delivery mark is at start of
delivery of cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN
 Edition : 23.10.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 456 122
 Injection pump
 Pump designation : PES6MW100/321RS1201
 EP type number : 0 413 406 190
 Governor
 Governor design. : RQ250/1200MW84-13
 Governor no. : 0 420 082 068

Customer-spec. information
 Customer : MAN

Engine : D 0826 LF02/LF06

1st version kW : 169.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)

Rack travel in mm : 15.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.80...12.90

Del. quantity cm³/ : 14.1...14.3

100 s: (13.8...14.6)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del. quantity cm³/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: 108

Speed rpm : 600

Rack travel in mm : 14.70...16.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1000

Del. quantity : 141.0...143.0

1000 : (138.0...146.0)

Spread cm³ : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 98...106

Setting point:

Speed rpm : 600

Rack travel in mm : 15.5

Testing:

1st rack travel in: 11.30

Speed rpm : 1245...1260

2nd rack travel in: 4.00
Speed rpm : 1300...1330
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 69...77
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 5.5

Testing:

Speed rpm : 150
Minimum rack travel: 7.00
Speed rpm : 250
Rack travel in mm : 5.40...5.60

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 800
Rack travel in m: 12.80...12.90
2nd speed rpm : 600
Rack travel in m: 12.70...12.90
3rd speed rpm : 1000
Rack travel in m: 12.50...12.70
4th speed rpm : 1200
Rack travel in m: 12.20...12.40

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 155
Rack travel mm : 10.30...10.40

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.00...10.10
2nd pressure hPa : 550
Rack travel in m: 12.00...12.30
3rd pressure hPa : 1000
Rack travel in m: 12.70...12.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 600
Del.quantity cm³/ : 138.0...142.0
1000 s: (135.0...145.0)
Spread cm³ : 6.00
1000 s: (7.0)
Aneroid pressure h: 1000

Speed rpm : 1000
Del.quantity cm³/ : 137.0...141.0
1000 s: (134.0...144.0)
Aneroid pressure h: 1000
Speed rpm : 1200
Del.quantity cm³/ : 134.0...138.0
1000 s: (131.0...141.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 74.0...76.0
1000 s: (72.0...78.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.30
Speed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 60.0...80.0
1000 s: (57.0...83.0)

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.40...5.60
Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

: MAN #3-7239

Start-of-delivery mark is at start of
delivery of cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN
 Edition : 03.12.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 456 123
 Injection pump
 Pump designation : PES6MW100/321RS1201
 EP type number : 0 413 406 190
 Governor
 Governor design. : RG250/1200MW84-14
 Governor no. : 0 420 082 069

Customer-spec. information
 Customer : MAN

Engine : D 0826 LF02/LF06
 1st version kW : 169.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 15.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.80...12.90

Del. quantity cm³/ : 14.1...14.3

100 s: (13.8...14.6)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del. quantity cm³/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1300

travel mm : 9.30...9.70

2nd speed rpm : 1200

travel mm : 7.20...7.40

3rd speed rpm : 600

travel mm : 6.80...7.20

4th speed rpm : 250

travel mm : 1.60...1.80

GUIDE SLEEVE POSITION

Control-lever position

Degree: 108

Speed rpm : 600

Rack travel in mm : 14.70...16.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1000

Del. quantity : 141.0...143.0

1000 : (138.0...146.0)

Spread cm³ : 4.00

1000 : (7.50)

RATED SPEED

1st version
Control lever
position degrees: 101...109

Setting point:
Speed rpm : 600
Rack travel in mm : 15.5

Testing:
1st rack travel in: 11.40
Speed rpm : 1245...1260
2nd rack travel in: 4.00
Speed rpm : 1295...1325
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 71...79
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 5.5

Testing:
Speed rpm : 150
Minimum rack travel: 7.00
Speed rpm : 250
Rack travel in mm : 5.40...5.60

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 800
Rack travel in m: 12.80...12.90
2nd speed rpm : 600
Rack travel in m: 12.70...12.90
3rd speed rpm : 1000
Rack travel in m: 12.50...12.70
4th speed rpm : 1200
Rack travel in m: 12.40...12.60

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.30...10.40

Measurement
Speed 1/min : 500

1st pressure hPa : 1000
Rack travel in m: 12.70...12.90
2nd pressure hPa : 155
Rack travel in m: 10.60...10.70
3rd pressure hPa : 550

L14

Rack travel in m: 12.20...12.50

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1000
Speed rpm : 600
Del.quantity cm3/ : 136.0...140.0
1000 s: (133.0...143.0)
Spread cm3 : 6.00
1000 s: (9.0)
Aneroid pressure h: 1000
Speed rpm : 1000
Del.quantity cm3/ : 137.0...141.0
1000 s: (134.0...144.0)
Aneroid pressure h: 1000
Speed rpm : 1200
Del.quantity cm3/ : 135.0...139.0
1000 s: (132.0...142.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 74.0...76.0
1000 s: (72.0...78.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 11.40
Speed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 60.0...80.0
1000 s: (57.0...83.0)

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.40...5.60
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:
: MAN #3-7240

Start-of-delivery mark is at start of
delivery of cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN
 Edition : 03.12.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 456 124
 Injection pump
 Pump designation : PES6MW100/321RS1201
 EP type number : 0 413 406 190
 Governor
 Governor design. : RGV250...975/1200MW1
 28
 Governor no. : 0 420 083 288

Customer-spec. information
 Customer : MAN

Engine : D 0826 LF08

1st version kw : 169.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)

Rack travel in mm : 15.00...0.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.80...12.90

Del. quantity cm³/ : 14.1...14.3

100 s: (13.8...14.6)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del. quantity cm³/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1250
 travel mm : 11.00...11.20

2nd speed rpm : 1050
 travel mm : 9.30...9.70

3rd speed rpm : 650
 travel mm : 4.20...4.80

4th speed rpm : 350
 travel mm : 2.10...2.50

5th speed rpm : 250
 travel mm : 1.20...1.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1000

Del. quantity : 141.0...143.0

1000 : (138.0...146.0)

Spread cm³ : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever
position degrees: 123...131

Testing:
1st rack travel in: 11.40
Speed rpm : 1245...1260
2nd rack travel in: 4.00
Speed rpm : 1295...1325
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1
Control lever
position degrees: 76...84
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 5.5

Testing:
Speed rpm : 150
Minimum rack travel: 7.00
Speed rpm : 250
Rack travel in mm : 5.40...5.60

TORQUE CONTROL
Dimension a mm : 0.40
Torque control curve - 1st version
1st speed rpm : 800
Rack travel in m: 12.80...12.90
2nd speed rpm : 600
Rack travel in m: 12.70...12.90
3rd speed rpm : 1000
Rack travel in m: 12.50...12.70
4th speed rpm : 1200
Rack travel in m: 12.40...12.60

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.30...10.40

Measurement
Speed 1/min : 500

1st pressure hPa : 1000
Rack travel in m: 12.70...12.90
2nd pressure hPa : 155
Rack travel in m: 10.60...10.70
3rd pressure hPa : 550
Rack travel in m: 12.20...12.50

FUEL DELIVERY CHARACTERISTICS

1st version

L16

Aneroid pressure h: 1000
Speed rpm : 600
Del.quantity cm³/ : 136.0...140.0
1000 s: (133.0...143.0)
Spread cm³ : 6.00
1000 s: (9.0)
Aneroid pressure h: 1000
Speed rpm : 1000
Del.quantity cm³/ : 137.0...141.0
1000 s: (134.0...144.0)
Aneroid pressure h: 1000
Speed rpm : 1200
Del.quantity cm³/ : 135.0...139.0
1000 s: (132.0...142.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 74.0...76.0
1000 s: (72.0...78.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.40
Speed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 60.0...80.0
1000 s: (57.0...83.0)

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.40...5.60
Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

: MAN #3-7253

Start-of-delivery mark is at start of
delivery of cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MAN
 Edition : 25.09.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 456 125
 Injection pump
 Pump designation : PES6MW100/321RS1201
 EP type number : 0 413 406 190
 Governor
 Governor design. : RQV250...975/1200MW1
 28-1
 Governor no. : 0 420 083 289

Customer-spec. information
 Customer : MAN

Engine : D 0826 LF02

1st version kW : 169.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.30...12.50

Del. quantity cm³/ : 14.1...14.3

100 s: (13.8...14.6)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del. quantity cm³/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm³ : 0.3

100 s: (0.5)

(B) Setting of injection pump
 with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1250
 travel mm : 11.00...11.20

2nd speed rpm : 1050
 travel mm : 9.30...9.70

3rd speed rpm : 650
 travel mm : 4.20...4.80

4th speed rpm : 350
 travel mm : 2.10...2.50

5th speed rpm : 250
 travel mm : 1.20...1.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800
 Aneroid pressure h: 1000
 Del. quantity : 141.0...143.0
 1000 : (138.0...146.0)
 Spread cm³ : 4.00
 1000 : (7.50)

RATED SPEED

1st version

Control lever
position degrees: 118...126

Testing:

1st rack travel in: 11.30
Speed rpm : 1245...1260
2nd rack travel in: 4.00
Speed rpm : 1285...1315
4th rack travel in: 1400
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever
position degrees: 76...84
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 5.5

Testing:

Speed rpm : 150
Minimum rack travel: 7.00
Speed rpm : 250
Rack travel in mm : 5.40...5.60

TORQUE CONTROL

Dimension a mm : 0.50
Torque control curve - 1st version
1st speed rpm : 800
Rack travel in m: 12.30...12.50
2nd speed rpm : 600
Rack travel in m: 12.60...12.80
3rd speed rpm : 1000
Rack travel in m: 12.20...12.40
4th speed rpm : 1200
Rack travel in m: 12.20...12.40

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 155
Rack travel mm : 10.30...10.40

Measurement

Speed 1/min : 500

1st pressure hPa : -
Rack travel in m: 10.00...10.10
2nd pressure hPa : 550
Rack travel in m: 11.90...12.20
3rd pressure hPa : 1000
Rack travel in m: 12.70...12.90

FUEL DELIVERY CHARACTERISTICS

1st version

L18

Aneroid pressure h: 1000
Speed rpm : 600
Del.quantity cm³/ : 139.0...143.0
1000 s: (136.0...146.0)
Spread cm³ : 6.00
1000 s: (9.0)
Aneroid pressure h: 1000
Speed rpm : 1000
Del.quantity cm³/ : 149.0...143.0
1000 s: (136.0...146.0)
Aneroid pressure h: 1000
Speed rpm : 1200
Del.quantity cm³/ : 136.5...140.5
1000 s: (133.5...143.5)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 74.0...76.0
1000 s: (72.0...78.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.30
Speed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 60.0...80.0
1000 s: (57.0...83.0)

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.40...5.60
Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

: MAN 3-7197

Start-of-delivery mark is at start of
delivery of cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM 8,3 N
 Edition : 27.11.92
 Replaces : 09.91
 Test oil : ISO-4113

Combination no. : 0 403 466 121

Injection pump
 Pump designation : PES6MW100/120RS1184
 EP type number : 0 413 406 171
 Governor
 Governor design. : RSV375...1250MW2A334
 Governor no. : 0 420 085 122

Customer-spec. information
 Customer : CUMMINS

Engine : 6 BTAA 5.9

1st version kw : 157.0
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 017

Opening
 pressure, bar : 207...210

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 10.80...10.90

Del.quantity cm³/ : 12.5...12.7

100 s: (12.3...12.9)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 375.0

Rack travel in mm : 6.5...7.0

Del.quantity cm³/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 800

Del.quantity : 125.0...127.0

1000 : (123.0...129.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 102...110

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.80

Speed rpm : 1295...1305

2nd rack travel in: 4.00
Speed rpm : 1370...1400
3rd rack travel in: 4.00
Speed rpm : 1415...1445
4th rack travel in: 1470
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 78...86
Setting point w/out bumper spring
Speed rpm : 375
Rack travel in mm : 5.7

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 375
Rack travel in mm : 5.50...6.00

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.70...9.80

Measurement

Speed 1/min : 500
1st pressure hPa : 490
Rack travel in m: 10.20...10.30
2nd pressure hPa : 550
Rack travel in m: 10.40...10.70
3rd pressure hPa : 800
Rack travel in m: 10.80...10.90

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500
Del.quantity cm³/ : 80.0...82.0
1000 s: (78.0...84.0)
Spread cm³ : 5.00
1000 s: (7.00)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 9.80
Speed rpm : 1295...1305

STARTING FUEL DELIVERY

L20

Speed rpm : 100
Del.quantity cm³/ : 73.0...83.0
1000 s: (70.0...86.0)

LOW IDLE

Speed rpm : 375
Rack travel in mm : 6.50...7.00
Del.quantity cm³/ : 16.0...20.0
1000 s: (13.5...22.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

: CUM #3280646

Start-of-delivery mark 9° cam angle
after start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : CUM
 Edition : 27.11.92
 Replaces : 07.92
 Test oil : ISO-4113

Combination no. : 0 403 466 130

Injection pump
 Pump designation : PES6MW100/120RS1137-
 2
 EP type number : 0 413 406 180
 Governor
 Governor design. : RSV550...1100MW2A335
 -4
 Governor no. : 0 420 085 206

Customer-spec. information
 Customer : CUMMINS

Engine : 6 CTA

1st version kW : 179.0
 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 1 688 901 101

Opening
 pressure, bar : 207...210

Orifice plate
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

L21

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Phasing :
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 14.50...14.60

Del. quantity cm³/ : 15.4...15.6

100 s: (15.1...15.9)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 550.0
 Rack travel in mm : 6.5...7.0
 Del. quantity cm³/ : 1.8...2.2
 100 s: (1.6...2.5)

Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension
 Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1100
 Aneroid pressure h: 900
 Del. quantity : 154.0...156.0
 1000 : (151.0...159.0)
 Spread cm³ : 4.00
 1000 : (7.50)

RATED SPEED

1st version
 Control lever
 position degrees: 93...101

Setting point:
Speed rpm : 800
Rack travel in mm : 0.6

Testing:
1st rack travel in: 13.50
Speed rpm : 1165...1175
2nd rack travel in: 4.00
Speed rpm : 1240...1250
3rd rack travel in: 4.00
Speed rpm : 1240...1270
4th rack travel in: 1350
Speed rpm : 0.30...1.70

LOW IDLE 1
Control lever
position degrees: 68...76
Setting point w/out bumper spring
Speed rpm : 550
Rack travel in mm : 6.2

Testing:
Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 550
Rack travel in mm : 6.00...6.50

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 14.50...14.60

Measurement
Speed 1/min : 500
Rack travel in m: 11.40...11.60
2nd pressure hPa : 400
Rack travel in m: 12.30...12.40
3rd pressure hPa : 630
Rack travel in m: 13.80...14.20

FUEL DELIVERY CHARACTERISTICS

1st version
Speed rpm : 500
Del.quantity cm³/ : 98.0...100.0
1000 s: (96.0...102.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 13.50
Speed rpm : 1165...1175

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 130.0...150.0
1000 s: (127.0...153.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 550
Rack travel in mm : 6.50...7.00
Del.quantity cm³/ : 18.5...22.5
1000 s: (16.0...25.0)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

: CUM #3925266

Start-of-delivery mark 9° cam angle
after start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE 5,6 B
 Edition : 23.10.92
 Replaces : 04.92
 Test oil : ISO-4113

Combination no. : 0 403 474 008

Injection pump
 Pump designation : PES4MW100/720RS1181
 EP type number : 0 413 404 107
 Governor
 Governor design. : RSV400...1000MW1A333
 Governor no. : 0 420 085 118

Customer-spec. information
 Customer : LIEBHERR

Engine : 914

1st version kw : 120.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42

Overflow valve : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder assembly : 0 681 343 009

Opening pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter x Wall thickness x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10
 : (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 980

Rack travel in mm : 12.10...12.20

Del.quantity cm³/ : 15.1...15.3

100 s: (14.8...15.6)

Spread cm³ : 0.4

100 s: (0.7)

2nd speed rpm : 400.0
 Rack travel in mm : 6.1...6.3
 Del.quantity cm³/ : 2.0...2.4
 100 s: (1.7...2.6)

Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3

Speed rpm : 800
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension
 Click setting x : 3.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 980
 Del.quantity : 151.0...153.0
 1000 : (148.0...156.0)

Spread cm³ : 4.00
 1000 : (7.50)

RATED SPEED

1st version
 Control lever
 position degrees: 96...104

Setting point:
 Speed rpm : 800
 Rack travel in mm : 0.6

Testing:

1st rack travel in: 11.10
Speed rpm : 1020...1030
2nd rack travel in: 4.00
Speed rpm : 1050...1080
4th rack travel in: 1175
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 5.7

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 400
Rack travel in mm : 5.60...5.80
Rack travel in mm : 2.00
Speed rpm : 480...540

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 980
Rack travel in m: 12.10...12.20
2nd speed rpm : 600
Rack travel in m: 12.10...12.20
5th speed rpm : 450
Rack travel in m: 13.00...13.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600
Del.quantity cm³/ : 152.0...156.0
1000 s: (149.0...159.0)
Spread cm³ : 6.00
1000 s: (9.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.10
Speed rpm : 1020...1030

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 130.0...140.0
1000 s: (127.0...143.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 6.10...6.30
Del.quantity cm³/ : 20.0...24.0
1000 s: (17.5...26.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE
 Edition : 23.10.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 474 008A
 Injection pump
 Pump designation : PES4MW100/720RS1181
 EP type number : 0 413 404 107
 Governor
 Governor design. : RSV400...1000MW1A333
 Governor no. : 0 420 085 118

Customer-spec. information
 Customer : LIEBHERR

Engine : 914
 1st version kw : 120.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 049
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 0 681 343 009
 Opening
 pressure, bar : 172...175
 Test lines : 1 680 750 008
 Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32
 Prestroke mm : 3.00...3.10
 : (2.95...3.15)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270
 Tolerance + - ° : 0.50 (0.75)
 Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 980
 Rack travel in mm : 12.10...12.20
 Del. quantity cm³/ : 15.1...15.3
 100 s: (15.1...15.7)
 Spread cm³ : 0.4
 100 s: (0.7)
 2nd speed rpm : 400.0
 Rack travel in mm : 6.1...6.3
 Del. quantity cm³/ : 2.0...2.4
 100 s: (1.7...2.6)
 Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension
 Click setting x : 3.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 980
 Del. quantity : 151.0...153.0
 1000 : (151.0...157.0)
 Spread cm³ : 4.00
 1000 : (7.50)

RATED SPEED

1st version
 Control lever
 position degrees: 96...104

Setting point:
 Speed rpm : 800
 Rack travel in mm : 0.6

Testing:

1st rack travel in: 11.10
Speed rpm : 1020...1030
2nd rack travel in: 4.00
Speed rpm : 1050...1060
4th rack travel in: 1175
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 5.7

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 400
Rack travel in mm : 5.60...5.80
Rack travel in mm : 2.00
Speed rpm : 480...540

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 980
Rack travel in m: 12.10...12.20
2nd speed rpm : 600
Rack travel in m: 12.10...12.20
5th speed rpm : 450
Rack travel in m: 13.00...13.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600
Del.quantity cm3/ : 152.0...156.0
1000 s: (149.0...159.0)
Spread cm3 : 6.00
1000 s: (9.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.10
Speed rpm : 1020...1030

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...140.0
1000 s: (127.0...143.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 6.10...6.30
Del.quantity cm3/ : 20.0...24.0
1000 s: (17.5...26.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE
 Edition : 21.08.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 474 0080
 Injection pump
 Pump designation : PES4MW100/72ORS1181
 EP type number : 0 413 404 107
 Governor
 Governor design. : RSV400...1000MW1A333
 Governor no. : 0 420 085 118

Customer-spec. information
 Customer : LIEBHERR

Engine : D914TI

1st version kW : 100.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test Lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10
 : (2.95...3.15)
 Rack travel in mm : 9.00...12.00

L27

Firing order : 1-3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 10.90...11.10

Del.quantity cm³/ : 13.5...13.7

100 s: (13.3...13.9)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.3...5.8

Del.quantity cm³/ : 1.7...2.1

100 s: (1.4...2.3)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del.quantity : 135.0...137.0

1000 : (133.0...139.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control Lever

position degrees: 90...98

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.90
Speed rpm : 920...930
2nd rack travel in: 4.00
Speed rpm : 960...975
3rd rack travel in: 4.00
Speed rpm : 975...990
4th rack travel in: 1075
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 69...77
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 5.0

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 400
Rack travel in mm : 4.80...5.30
Rack travel in mm : 2.00
Speed rpm : 480...540

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500
Del.quantity cm3/ : 128.0...131.0
1000 s: (125.5...133.5)
Spread cm3 : 3.50
1000 s: (7.0)
Speed rpm : 700
Del.quantity cm3/ : 136.0...139.0
1000 s: (133.5...141.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.90
Speed rpm : 920...930

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...140.0
1000 s: (127.0...143.0)
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.30...5.80
Del.quantity cm3/ : 17.0...21.0
1000 s: (14.5...23.5)

Spread cm3 : 3.50
1000 s: (5.00)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE
 Edition : 21.08.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 474 008E
 Injection pump
 Pump designation : PES4MW100/720RS1181
 EP type number : 0 413 404 107
 Governor
 Governor design. : RSV400...1000MW1A333
 Governor no. : 0 420 085 118

Customer-spec. information
 Customer : LIEBHERR

Engine : D914T

1st version kW : 100.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10
 : (2.95...3.15)
 Rack travel in mm : 9.00...12.00

MO1

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000
 Rack travel in mm : 10.70...10.90
 Del.quantity cm³/ : 13.0...13.2
 100 s: (12.8...13.4)
 Spread cm³ : 0.3
 100 s: (0.6)

2nd speed rpm : 400.0
 Rack travel in mm : 5.5...6.0
 Del.quantity cm³/ : 2.0...2.4
 100 s: (1.7...2.6)
 Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension
 Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1000
 Del.quantity : 130.0...132.0
 1000 : (128.0...134.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 95...103

Setting point:
 Speed rpm : 800
 Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.70
Speed rpm : 1020...1030
2nd rack travel in: 4.00
Speed rpm : 1060...1075
3rd rack travel in: 4.00
Speed rpm : 1070...1085
4th rack travel in: 1175
Speed rpm : 0.30...1.70

Spread cm³ : 3.50
1000 s: (5.00)

Remarks:

:

LOW IDLE 1

Control lever
position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 400
Rack travel in mm : 5.2

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 400
Rack travel in mm : 5.00...5.50
Rack travel in mm : 2.00
Speed rpm : 480...540

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500
Del. quantity cm³/ : 126.5...129.5
1000 s: (124.0...132.0)
Spread cm³ : 3.50
1000 s: (7.0)
Speed rpm : 800
Del. quantity cm³/ : 133.5...136.5
1000 s: (131.0...139.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.70
Speed rpm : 1020...1030

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 130.0...140.0
1000 s: (127.0...143.0)
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.50...6.00
Del. quantity cm³/ : 20.0...24.0
1000 s: (17.5...26.5)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE
 Edition : 21.08.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 474 008F
 Injection pump
 Pump designation : PES4MW100/72ORS1181
 EP type number : 0 413 404 107
 Governor
 Governor design. : RSV400...1000MW1A333
 Governor no. : 0 420 085 118

Customer-spec. information
 Customer : LIEBHERR

Engine : D914T

1st version kW : 100.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10
 : (2.95...3.15)

Rack travel in mm : 9.00...12.00

M03

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 10.70...10.90

Del. quantity cm³/ : 13.0...13.2

100 s: (12.8...13.4)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 500.0

Rack travel in mm : 4.5...5.0

Del. quantity cm³/ : 2.4...2.8

100 s: (2.1...3.0)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del. quantity : 130.0...132.0

1000 : (128.0...134.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 90...98

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.70
Speed rpm : 920...930
2nd rack travel in: 4.00
Speed rpm : 960...975
3rd rack travel in: 4.00
Speed rpm : 975...990
4th rack travel in: 1075
Speed rpm : 0.30...1.70

Remarks:

LOW IDLE 1

Control lever
position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 500
Rack travel in mm : 4.2

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 500
Rack travel in mm : 4.00...4.50

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500
Del.quantity cm3/ : 126.5...129.5
1000 s: (124.0...132.0)
Spread cm3 : 3.50
1000 s: (7.0)
Speed rpm : 700
Del.quantity cm3/ : 133.5...136.5
1000 s: (131.0...139.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.70
Speed rpm : 920...930

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 130.0...140.0
1000 s: (127.0...143.0)
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 500
Rack travel in mm : 4.50...5.00
Del.quantity cm3/ : 24.0...28.0
1000 s: (21.5...30.5)
Spread cm3 : 3.50
1000 s: (5.00)

M04

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 4,0 A 32
 Edition : 21.08.92
 Replaces : 12.91
 Test oil : ISO-4113
 Combination no. : 0 403 474 010
 Injection pump
 Pump designation : PES4MW100/72ORS1127
 EP type number : 0 413 404 103
 Governor
 Governor design. : RSV350...750MWOA336-5
 Governor no. : 0 420 085 164

Customer-spec. information
 Customer : MB-NFZ

Engine : OM364A

1st version kW : 84.0
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 419 992 198
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 0 681 343 009
 Opening
 pressure, bar : 172...175
 Test lines : 1 680 750 089
 Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)

M05

Rack travel in mm : 9.00...12.00
 Firing order : 1-3-4-2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 700
 Rack travel in mm : 13.80...13.90

Del. quantity cm³/ : 9.5...9.7
 100 s: (9.3...9.9)

Spread cm³ : 0.3
 100 s: (0.6)

2nd speed rpm : 350.0
 Rack travel in mm : 7.3...7.9
 Del. quantity cm³/ : 0.9...1.3
 100 s: (0.6...1.5)
 Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension
 Click setting x : 2.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700
 Del. quantity : 95.0...97.0
 1000 : (93.0...99.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 76...84

Setting point:
 Speed rpm : 800
 Rack travel in mm : 0.6

Testing:
 1st rack travel in: 12.80

Speed rpm : 750...755 *
2nd rack travel in: 4.00
Speed rpm : 788...793
4th rack travel in: 350
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever
position degrees: 68...76
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 7.6
Speed rpm : 350
Rack travel in mm : 7.30...7.90

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 12.80
Speed rpm : 750..755

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 90.0...100.0
1000 s: (87.0...103.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 7.30...7.90
Del.quantity cm³/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

See VDT-I-401/102.

* Read off speed set under 1.
Add 30...38 min⁻¹ to this speed. The
control-rod travel under 2. must be
attained with the calculated speed
profile.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE
 Edition : 21.08.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 474 012A
 Injection pump
 Pump designation : PES4MW100/720RS1207
 EP type number : 0 413 404 113
 Governor
 Governor design. : RSV350...1000MWOA333
 -1
 Governor no. : 0 420 085 153

Customer-spec. information
 Customer : LIEBHERR

Engine : D 914 T

1st version kW : 110.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.30...3.40
 : (3.25...3.45)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.50...11.60

Del. quantity cm³/ : 13.3...13.5

100 s: (13.1...13.7)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.4...6.6

Del. quantity cm³/ : 1.4...1.8

100 s: (1.1...2.0)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del. quantity : 133.0...135.0

1000 : (131.0...137.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 96...104

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.50
Speed rpm : 1040...1050
2nd rack travel in: 4.00
Speed rpm : 1110...1140
4th rack travel in: 1275
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 72...80
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.0

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 350
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00
Speed rpm : 390...450

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000
Rack travel in m: 11.50...11.60
2nd speed rpm : 700
Rack travel in m: 11.50...11.60
3rd speed rpm : 500
Rack travel in m: 11.50...11.60
5th speed rpm : 400
Rack travel in m: 13.00...13.10

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700
Del.quantity cm3/ : 132.0...135.0
1000 s: (129.5...137.5)
Spread cm3 : 3.50
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.50
Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100

M08

Del.quantity cm3/ : 130.0...140.0
1000 s: (127.0...143.0)
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.40...6.60
Del.quantity cm3/ : 14.0...18.0
1000 s: (11.5...20.5)
Spread cm3 : 3.50
1000 s: (5.00)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 4,0 J
 Edition : 21.08.92
 Replaces : 12.91
 Test oil : ISO-4113

Combination no. : 0 403 474 013

Injection pump
 Pump designation : PES4MW100/720RS1127
 EP type number : 0 413 404 103
 Governor
 Governor design. : RSV750...1250MWA318
 -8
 Governor no. : 0 420 085 167

Customer-spec. information
 Customer : MB-NFZ

Engine : OM 364 A

1st version kW : 84.0
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1230

Rack travel in mm : 12.40...12.50

Del.quantity cm³/ : 8.4...8.6

100 s: (8.2...8.8)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 750.0

Rack travel in mm : 6.3...6.9

Del.quantity cm³/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 2.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1230

Del.quantity : 84.0...86.0

1000 : (82.0...88.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 88...96

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 11.40

Speed rpm : 1270...1275 *
2nd rack travel in: 4.00
Speed rpm : 1295...1310
4th rack travel in: 1450
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 750
Rack travel in mm : 6.6

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 750
Rack travel in mm : 6.30...6.90
Rack travel in mm : 2.00
Speed rpm : 750...810

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750
Del. quantity cm³/ : 73.0...76.0
1000 s: (70.5...78.5)
Spread cm³ : 5.00
1000 s: (7.0)

RACK STOP ADJUSTMENT

Speed rpm : 100

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 83.0...93.0
1000 s: (80.0...96.0)

LOW IDLE

Speed rpm : 750
Rack travel in mm : 6.30...6.90
Del. quantity cm³/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

* Read off speed set under 1.
Add 25...35 min⁻¹ to this speed. The

control-rod travel under 2. must be
attained with the calculated speed
profile.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 4,0 H 7
 Edition : 30.10.92
 Replaces : 02.92
 Test oil : ISO-4113

Combination no. : 0 403 474 019

Injection pump
 Pump designation : PES4MW100/720RS1151
 EP type number : 0 413 404 104
 Governor
 Governor design. : RSV350...1200MWOA346
 -3

Governer no. : 0 420 085 179

Customer-spec. information
 Customer : MB-NFZ

Engine : OM 364 A

1st version kW : 77.0
 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00
 Firing order : 1-3-4-2

Phasing : 0-90-180-270

Tolerance + - * : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 11.50...11.60

Del.quantity cm³/ : 8.8...9.0

100 s : (8.6...9.2)

Spread cm³ : 0.3

100 s : (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.0...6.8

Del.quantity cm³/ : 1.0...1.4

100 s : (0.7...1.6)

Spread cm³ : 0.3

100 s : (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 700

Del.quantity : 88.0...90.0

1000 : (86.0...92.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 104...112

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.50
Speed rpm : 1240...1245 +
2nd rack travel in: 4.00
Speed rpm : 1285...1298
4th rack travel in: 1450
Speed rpm : 0.30...1.70

LOW IDLE 1

Testing:

Speed rpm : 100
Minimum rack travel: 19.00

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1200
Rack travel in m: 11.50...11.60
2nd speed rpm : 600
Rack travel in m: 12.30...12.50
3rd speed rpm : 1000
Rack travel in m: 11.90...12.10

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.90...10.00

Measurement

Speed 1/min : 500

1st pressure hPa : 200
Rack travel in m: 10.40...10.50
2nd pressure hPa : 375
Rack travel in m: 11.50...11.80
3rd pressure hPa : 700
Rack travel in m: 12.30...12.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 600
Del. quantity cm³/ : 83.5...86.5
1000 s: (81.0...89.0)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del. quantity cm³/ : 49.0...51.0
1000 s: (47.0...53.0)

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 75.0...85.0
1000 s: (72.0...88.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.00...6.80
Del. quantity cm³/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

* Read off speed set under 1.
Add 45...53 min⁻¹ to this speed. The
control-rod travel under 2. must be
attained with the calculated speed
profile.

Set pneumatic shutoff device to
control-rod stop = 0.5...1.5 mm
control-rod travel at 4.5 bar
atmospheric pressure.
Test hydr. locking device for starting
with 800...1200 hPa air pressure.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE
 Edition : 21.08.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 474 021A
 Injection pump
 Pump designation : PES4MW100/72ORS1181
 EP type number : 0 413 404 107
 Governor
 Governor design. : RSV400...1000MW1A348
 Governor no. : 0 420 085 183

Customer-spec. information
 Customer : LIEBHERR

Engine : D914T

1st version kw : 100.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10
 : (2.95...3.15)
 Rack travel in mm : 9.00...12.00

M13

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 10.70...10.90

Del. quantity cm³/ : 13.0...13.2

100 s: (12.8...13.4)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 6.0...6.5

Del. quantity cm³/ : 2.0...2.4

100 s: (1.7...2.6)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del. quantity : 130.0...132.0

1000 : (128.0...134.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 104...112

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.70
 Speed rpm : 1020...1030
 2nd rack travel in: 4.00
 Speed rpm : 1060...1075
 3rd rack travel in: 4.00
 Speed rpm : 1070...1085
 4th rack travel in: 1200
 Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
 position degrees: 76...84
 Setting point w/out bumper spring
 Speed rpm : 400
 Rack travel in mm : 5.7

Testing:

Speed rpm : 100
 Minimum rack travel: 19.00
 Speed rpm : 400
 Rack travel in mm : 5.50...6.00
 Rack travel in mm : 2.00
 Speed rpm : 450...510

TORQUE CONTROL

Torque control curve - 1st version
 1st speed rpm : 1000
 Rack travel in m: 10.70...10.90
 2nd speed rpm : 500
 Rack travel in m: 10.70...10.90
 5th speed rpm : 450
 Rack travel in m: 11.90...12.10

Aneroid/Altitude
Compensator Test

1st version

Setting
 Speed rpm : 500
 Pressure hPa : -
 Rack travel mm : 10.20...10.40

Measurement

Speed 1/min : 500
 1st pressure hPa : 530
 Rack travel in m: 10.50...10.60
 2nd pressure hPa : 1000
 Rack travel in m: 10.70...10.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
 Speed rpm : 500
 Del.quantity cm3/ : 123.5...126.5
 1000 s: (121.0...129.0)

Spread cm3 : 3.50
 1000 s: (7.0)
 Aneroid pressure h: 1000
 Speed rpm : 800
 Del.quantity cm3/ : 130.0...133.0
 1000 s: (127.5...135.5)
 Aneroid pressure h: -
 Speed rpm : 500
 Del.quantity cm3/ : 109.0... 111.0
 1000 s: (107.0...113.0)

BREAKAWAY

1st version
 1mm rack travel less than

full load rack tr: 9.70
 Speed rpm : 1020...1030

STARTING FUEL DELIVERY

Speed rpm : 100
 Del.quantity cm3/ : 130.0...140.0
 1000 s: (127.0...143.0)
 Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
 Rack travel in mm : 6.00...6.50
 Del.quantity cm3/ : 20.0...24.0
 1000 s: (17.5...26.5)
 Spread cm3 : 3.50
 1000 s: (5.00)

Remarks:

:
 Check electrically unlatched starting
 fuel delivery (EES) with 24 volt.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB
 Edition : 05.10.92
 Replaces : 03.92
 Test oil : ISO-4113
 Combination no. : 0 403 474 022
 Injection pump
 Pump designation : PES4MW100/72ORS1151
 EP type number : 0 413 404 104
 Governor
 Governor design. : RSV350...1300MWOA329
 -12
 Governor no. : 0 420 085 189

Customer-spec. information
 Customer : MB-NFZ

Engine : OM364A

1st version kW : 79.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1280
 Rack travel in mm : 10.90...11.00
 Del. quantity cm³/ : 8.2...8.4
 100 s: (8.0...8.6)
 Spread cm³ : 0.3
 100 s: (0.6)

2nd speed rpm : 350.0
 Rack travel in mm : 6.0...6.8
 Del. quantity cm³/ : 1.0...1.4
 100 s: (0.7...1.6)
 Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension
 Click setting x : 6.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1280
 Aneroid pressure h: 700
 Del. quantity : 82.0...84.0
 1000 : (80.0...86.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 95...103

Setting point:
 Speed rpm : 800
 Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.90
Speed rpm : 1330...1335 *
2nd rack travel in: 4.00
Speed rpm : 1410...1423
4th rack travel in: 1550
Speed rpm : 0.30...1.70

LOW IDLE 1

Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.4

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 350
Rack travel in mm : 6.00...6.80

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Dimension a mm : 0.80
Torque control curve - 1st version
1st speed rpm : 1280
Rack travel in m: 10.90...11.00
2nd speed rpm : 600
Rack travel in m: 11.80...11.90
3rd speed rpm : 1000
Rack travel in m: 11.70...11.90
4th speed rpm : 1175
Rack travel in m: 11.00...11.30

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.80...10.00

Measurement

Speed 1/min : 500
1st pressure hPa : 200
Rack travel in m: 10.70...10.90
2nd pressure hPa : 300
Rack travel in m: 11.20...11.40
3rd pressure hPa : 700
Rack travel in m: 11.70...11.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700
Speed rpm : 600

Del.quantity cm³/ : 75.0...78.0
1000 s: (72.5...80.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 46.0...48.0
1000 s: (44.0...50.0)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 9.90
Speed rpm : 1330...1335

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 78.0...88.0
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.00...6.80
Del.quantity cm³/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

Test hydr. locking device for starting
with 800...1200 hPa air pressure.

* Read off speed set under 1.
Add 80...88 min⁻¹ to this speed. The
control-rod travel under 2. must be
attained with the calculated speed
profile.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : VME
Edition : 03.12.92
Replaces : -
Test oil : ISO-4113

Combination no. : 0 403 474 024

Injection pump
Pump designation : PES4MW100/320RS1223
EP type number : 0 413 404 119
Governor
Governor design. : RSV300...1000MW1A351
Governor no. : 0 420 085 204

Customer-spec. information
Customer : VME

Engine : TD45E

1st version kW : 84.0
Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter
x Wall thickness
x Length mm : 6.00x2.00x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10
: (2.95...3.15)
Rack travel in mm : 12.50...13.50

M17

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 14.60...14.70

Del. quantity cm³/ : 13.3...13.5

100 s: (13.0...13.8)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 4.6...5.0

Del. quantity cm³/ : 1.8...2.2

100 s: (1.5...2.4)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1200

Del. quantity : 133.0...135.0

1000 : (130.0...138.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 102...110

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.60

Speed rpm : 1040...1050
2nd rack travel in: 4.00
Speed rpm : 1100...1130
3rd rack travel in: 4.00
Speed rpm : 1120...1150
4th rack travel in: 1250
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 4.3

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 300
Rack travel in mm : 4.10...4.50

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 550
Rack travel mm : 12.20...12.40

Measurement

Speed 1/min : 550

1st pressure hPa : 255
Rack travel in m: 12.6...12.7
2nd pressure hPa : 520
Rack travel in m: 13.9...14.1
3rd pressure hPa : 800
Rack travel in m: 14.0...14.2
4th pressure hPa : 960
Rack travel in m: 14.3...14.5
5th pressure hPa : 1200
Rack travel in m: 14.6...14.7

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -
Speed rpm : 550
Del.quantity cm³/ : 84.0...86.0
1000 s: (82.0...88.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 13.60

Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 140.0...160.0
1000 s: (137.0...163.0)
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 300
Rack travel in mm : 4.60...5.00
Del.quantity cm³/ : 18.0...22.0
1000 s: (15.5...24.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 41
 Edition : 21.08.92
 Replaces : 05.88
 Test oil : ISO-4113
 Combination no. : 0 403 476 037
 Injection pump
 Pump designation : PES6MW100/72ORS1130
 EP type number : 0 413 406 122
 Governor
 Governor design. : RSV350...1300MWOA318
 Governor no. : 0 420 085 052

Customer-spec. information
 Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 125.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 419 992 198
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32
 Prestroke mm : 3.70...3.80
 : (3.65...3.85)
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1280

Rack travel in mm : 11.00...11.10

Del. quantity cm³/ : 7.7...7.9

100 s: (7.5...8.1)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 8.0...8.2

Del. quantity cm³/ : 0.9...1.3

100 s: (0.7...1.5)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1280

Del. quantity : 77.0...79.0

1000 : (75.0...81.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 105...113

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.00

Speed rpm : 1320...1330

2nd rack travel in: 4.00

Speed rpm : 1380...1410

4th rack travel in: 1560

Speed rpm : 0.30...1.70

Spread cm³ : 3.50
1000 s: (5.50)

LOW IDLE 1

Control lever
position degrees: 75...83
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 8.1

Remarks:

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 350
Rack travel in mm : 8.00...8.20

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1280
Rack travel in m: 11.00...11.20
2nd speed rpm : 750
Rack travel in m: 11.70...11.80
3rd speed rpm : 825
Rack travel in m: 11.40...11.60

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750
Del.quantity cm³/ : 72.0...74.0
1000 s: (70.0...76.0)
Spread cm³ : 5.00
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than
full load rack tr: 10.00
Speed rpm : 1320...1330

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 78.0...88.0
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 8.00...8.20
Del.quantity cm³/ : 9.0...13.0
1000 s: (7.0...15.0)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 d 6
 Edition : 21.08.92
 Replaces : 05.88
 Test oil : ISO-4113

Combination no. : 0 403 476 041

Injection pump
 Pump designation : PES6MW100/72ORS1129
 EP type number : 0 413 406 121
 Governor
 Governor design. : RSV350...750MWOA318-
 2
 Governor no. : 0 420 085 056

Customer-spec. information
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 94.0
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.50...12.60

Del. quantity cm³/ : 8.5...8.7
 100 s: (8.3...8.9)

Spread cm³ : 0.3
 100 s: (0.6)

2nd speed rpm : 350.0
 Rack travel in mm : 6.1...6.2
 Del. quantity cm³/ : 0.9...1.3
 100 s: (0.7...1.5)

Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700
 Del. quantity : 85.0...87.0
 1000 : (83.0...89.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 74...82

Setting point:
 Speed rpm : 800
 Rack travel in mm : 0.6

Testing:
 1st rack travel in: 11.5
 Speed rpm : 750...755 *
 2nd rack travel in: 4.00
 Speed rpm : 775...788

4th rack travel in: 820
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 60...68
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.1

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 350
Rack travel in mm : 6.10...6.20

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.5
Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 88.0...98.0
1000 s: (85.0...101.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.10...6.20
Del.quantity cm³/ : 9.0...13.0
1000 s: (7.0...15.0)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

* Read off speed set under 1.
Add 25...33 min⁻¹ to this speed. The
control-rod travel under 2. must be
attained with the calculated speed
profile.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 57
 Edition : 21.08.92
 Replaces : 02.89
 Test oil : ISO-4113

Combination no. : 0 403 476 059

Injection pump
 Pump designation : PES6MW100/720RS1130
 EP type number : 0 413 406 122
 Governor
 Governor design. : RSV750...1250MWOA325
 -1
 Governor no. : 0 420 085 112

Customer-spec. information
 Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 125.0
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1230

Rack travel in mm : 10.90...11.00

Del. quantity cm³/ : 7.8...8.0
 100 s: (7.6...8.2)

Spread cm³ : 0.3
 100 s: (0.6)

2nd speed rpm : 750.0
 Rack travel in mm : 5.6...5.7
 Del. quantity cm³/ : 0.9...1.3
 100 s: (0.7...1.5)

Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1230
 Del. quantity : 78.0...80.0
 1000 : (76.0...82.0)

Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 96...104

Setting point:

Speed rpm : 800
 Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.90
 Speed rpm : 1270...1275 *
 2nd rack travel in: 4.00
 Speed rpm : 1295...1340

4th rack travel in: 1350
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 74...82
Setting point w/out bumper spring
Speed rpm : 750
Rack travel in mm : 5.6

Testing:

Speed rpm : 100
Minimum rack trave: 19.00
Speed rpm : 750
Rack travel in mm : 5.60...5.70

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600
Del.quantity cm³/ : 55.0...59.0
1000 s: (53.0...61.0)
Spread cm³ : 5.00
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.90
Speed rpm : 1270...1275

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 78.0...88.0
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 750
Rack travel in mm : 5.60...5.70
Del.quantity cm³/ : 9.0...13.0
1000 s: (7.0...15.0)
Spread cm³ : 3.50
1000 s: (5.00)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 39
 Edition : 21.08.92
 Replaces : 08.90
 Test oil : ISO-4113
 Combination no. : 0 403 476 062
 Injection pump
 Pump designation : PES6MW100/72ORS1172
 EP type number : 0 413 406 155
 Governor
 Governor design. : RSV350...1300MWA329
 -1
 Governor no. : 0 420 085 091

Customer-spec. information
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 169.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve
 : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)

Rack travel in mm : 19.00...21.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1280

Rack travel in mm : 14.40...14.50

Del. quantity cm³/ : 10.5...10.7

100 s: (10.3...10.9)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del. quantity cm³/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1280

Aneroid pressure h: 1000

Del. quantity : 105.0...107.0

1000 : (103.0...109.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 96...104

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.40

Speed rpm : 1320...1330

2nd rack travel in: 4.00

Speed rpm : 1395...1425
4th rack travel in: 1450
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 62...70
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.0

Testing:

Speed rpm : 100
Minimum rack travel: 7.60
Speed rpm : 350
Rack travel in mm : 5.90...6.10

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.70...10.80

Measurement

Speed 1/min : 500

1st pressure hPa : 450
Rack travel in m: 11.90...12.10
2nd pressure hPa : 650
Rack travel in m: 13.40...13.60
3rd pressure hPa : 1000
Rack travel in m: 14.40...14.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 900
Del.quantity cm³/ : 98.0...101.0
1000 s: (95.5...103.5)
Spread cm³ : 5.00
1000 s: (7.0)

Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 31.0...33.0
1000 s: (29.0...35.0)
Spread cm³ : 3.50
1000 s: (6.00)

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 13.40
Speed rpm : 1320...1330

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 90.0...100.0
1000 s: (87.0...103.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.90...6.10
Del.quantity cm³/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm³ : 3.50
1000 s: (5.00)

Remarks:

:

Test hydr. locking device for starting
with 500...1000 hPa air pressure.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 5,7 A 18
 Edition : 21.08.92
 Replaces : 09.88
 Test oil : ISO-4113
 Combination no. : 0 403 476 063
 Injection pump
 Pump designation : PES6MW100/72ORS1125
 EP type number : 0 413 406 119
 Governor
 Governor design. : RSV350...1300MWOA329
 -3
 Governor no. : 0 420 085 094

Customer-spec. information
 Customer : MB-NFZ

Engine : OM 362 LA

1st version kW : 134.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 419 992 198
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 0 681 343 009
 Opening
 pressure, bar : 172...175
 Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32
 Prestroke mm : 3.20...3.30
 : (3.15...3.35)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1280
 Rack travel in mm : 11.80...11.90
 Del. quantity cm³/ : 9.6...9.8
 100 s: (9.4...10.0)
 Spread cm³ : 0.3
 100 s: (0.6)
 2nd speed rpm : 350.0
 Rack travel in mm : 5.9...6.0
 Del. quantity cm³/ : 1.1...1.5
 100 s: (0.9...1.7)
 Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1280
 Aneroid pressure h: 900
 Del. quantity : 96.0...98.0
 1000 : (94.0...100.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 105...113

Setting point:
 Speed rpm : 800
 Rack travel in mm : 0.6

Testing:
 1st rack travel in: 10.80
 Speed rpm : 1330...1340
 2nd rack travel in: 4.00

Speed rpm : 1400...1430
4th rack travel in: 1560
Speed rpm : 0.30...1.70

LOW IDLE 1

Control Lever
position degrees: 62...70
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.9

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 350
Rack travel in mm : 5.90...6.00

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : 900
Rack travel mm : 11.80...11.90

Measurement

Speed 1/min : 500

1st pressure hPa : 350
Rack travel in m: 10.60...10.70
2nd pressure hPa : 450
Rack travel in m: 11.30...11.60
3rd pressure hPa : -
Rack travel in m: 9.70...9.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 800
Del.quantity cm³/ : 88.5...91.5
1000 s: (86.0...94.0)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 46.0...48.0
1000 s: (44.0...50.0)

BREAKAWAY

1st version

M28

1mm rack travel less than

full load rack tr: 10.80
Speed rpm : 1330...1340

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 88.0...98.0
1000 s: (85.0...101.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.90...6.00
Del.quantity cm³/ : 11.0...15.0
1000 s: (9.0...17.0)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

Test hydr. locking device for starting
with 500...1000 hPa air pressure.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 49
 Edition : 21.08.92
 Replaces : 08.90
 Test oil : ISO-4113
 Combination no. : 0 403 476 064
 Injection pump
 Pump designation : PES6MW100/720RS1129
 FP type number : 0 413 406 121
 Governor
 Governor design. : RSV350...1300MWOA329
 -2
 Governor no. : 0 420 085 095

Customer-spec. information
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 150.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness : 8.00x2.50x600
 x Length mm

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1280
 Rack travel in mm : 11.50...11.60
 Del. quantity cm³/ : 9.7...9.9
 100 s: (9.5...10.1)
 Spread cm³ : 0.3
 100 s: (0.6)

2nd speed rpm : 350.0
 Rack travel in mm : 5.5...5.7
 Del. quantity cm³/ : 0.8...1.2
 100 s: (0.6...1.4)
 Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1280
 Aneroid pressure h: 900
 Del. quantity : 97.0...99.0
 1000 : (95.0...101.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 106...114

Setting point:
 Speed rpm : 800
 Rack travel in mm : 0.6

Testing:
 1st rack travel in: 10.50
 Speed rpm : 1320...1330
 2nd rack travel in: 4.00

Speed rpm : 1385...1415
4th rack travel in: 1450
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 72...80
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.6

Testing:

Speed rpm : 100
Minimum rack travel: 7.60
Speed rpm : 350
Rack travel in mm : 5.50...5.70

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.50...9.60

Measurement

Speed 1/min : 500

1st pressure hPa : 175
Rack travel in m: 10.00...10.10
2nd pressure hPa : 300
Rack travel in m: 10.80...11.10
3rd pressure hPa : 900
Rack travel in m: 11.50...11.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900
Speed rpm : 750
Del.quantity cm³/ : 86.5...89.5
1000 s: (84.0...92.0)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 48.0...50.0
1000 s: (46.0...52.0)

BREAKAWAY

1st version

NO2

1mm rack travel less than

full load rack tr: 10.50
Speed rpm : 1320...1330

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 88.0...98.0
1000 s: (85.0...101.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.50...5.70
Del.quantity cm³/ : 8.0...12.0
1000 s: (6.0...14.0)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

Test hydr. locking device for starting
with 500...1000 hPa air pressure.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 52
 Edition : 21.08.92
 Replaces : 02.89
 Test oil : ISO-4113
 Combination no. : 0 403 476 066
 Injection pump
 Pump designation : PES6MW100/720RS1130
 EP type number : 0 413 406 122
 Governor
 Governor design. : RSV350...1300MWOA318
 -5
 Governor no. : 0 420 085 100

Customer spec. information
 Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 130.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 419 992 198
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 0 681 343 009
 Opening
 pressure, bar : 172...175
 Test lines : 1 680 750 089
 Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32
 Prestroke mm : 3.70...3.80
 : (3.65...3.85)

NO3

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1280
 Rack travel in mm : 11.00...11.10
 Del. quantity cm³/ : 8.1...8.3
 100 s : (7.9...8.5)
 Spread cm³ : 0.3
 100 s : (0.6)

2nd speed rpm : 350.0
 Rack travel in mm : 7.9...8.1
 Del. quantity cm³/ : 0.9...1.3
 100 s : (0.7...1.5)
 Spread cm³ : 0.3
 100 s : (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension
 Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1280
 Del. quantity : 81.0...83.0
 1000 : (79.0...85.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 105...113

Setting point:
 Speed rpm : 800
 Rack travel in mm : 0.6

Testing:
 1st rack travel in: 10.00

Speed rpm : 1330...1340
2nd rack travel in: 4.00
Speed rpm : 1400...1430
4th rack travel in: 1560
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 75...83
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 8.0

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 350
Rack travel in mm : 7.90...8.10

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750
Del. quantity cm³/ : 68.0...71.0
1000 s: (65.5...73.5)
Spread cm³ : 5.00
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.00
Speed rpm : 1330...1340

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 78.0...88.0
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 7.90...8.10
Del. quantity cm³/ : 9.0...13.0
1000 s: (7.0...15.0)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 60
 Edition : 21.08.92
 Replaces : 03.89
 Test oil : ISO-4113

Combination no. : 0 403 476 069

Injection pump
 Pump designation : PES6MW100/720RS1129
 EP type number : 0 413 406 121
 Governor
 Governor design. : RSV750...1250MWOA325
 -2

Governer no. : 0 420 085 115

Customer-spec. information
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kw : 146.0
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)

N05

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1230

Rack travel in mm : 11.50...11.60

Del.quantity cm³/ : 9.7...9.9

100 s : (9.5...10.1)

Spread cm³ : 0.3

100 s : (0.6)

2nd speed rpm : 750.0
 Rack travel in mm : 4.9...5.1
 Del.quantity cm³/ : 1.0...1.4
 100 s : (0.7...1.6)
 Spread cm³ : 0.3
 100 s : (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension
 Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1230
 Del.quantity : 97.0...99.0
 1000 : (95.0...101.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 94...102

Setting point:
 Speed rpm : 800
 Rack travel in mm : 0.6

Testing:
 1st rack travel in: 10.5

Speed rpm : 1270...1275 *
2nd rack travel in: 4.00
Speed rpm : 1295...1310
4th rack travel in: 1350
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 74...82
Setting point w/out bumper spring
Speed rpm : 750
Rack travel in mm : 5.0

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 750
Rack travel in mm : 4.90...5.10

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600
Del. quantity cm³/ : 85.0...89.0
1000 s: (83.0...91.0)
Spread cm³ : 5.00
1000 s: (7.0)

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 88.0...98.0
1000 s: (85.0...101.0)

LOW IDLE

Speed rpm : 750
Rack travel in mm : 4.90...5.10
Del. quantity cm³/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm³ : 3.50
1000 s: (5.00)

Remarks:

:

* Read off speed set under 1.
Add 25...35 min⁻¹ to this speed. The
control-rod travel under 2. must be
attained with the calculated speed
profile.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 66
 Edition : 21.08.92
 Replaces : 04.90
 Test oil : ISO-4113
 Combination no. : 0 403 476 070
 Injection pump
 Pump designation : PES6MW100/720RS1172
 EP type number : 0 413 406 155
 Governor
 Governor design. : RSV350...1300MWA329
 -4
 Governor no. : 0 420 085 116

Customer-spec. information
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 170.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)

NO7

Rack travel in mm : 19.00...21.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1280

Rack travel in mm : 14.70...14.80

Del. quantity cm³/ : 10.8...11.0

100 s: (10.6...11.2)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del. quantity cm³/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1280

Aneroid pressure h: 1000

Del. quantity : 108.0...110.0

1000 : (106.0...112.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 96...104

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.70

Speed rpm : 1330...1340

2nd rack travel in: 4.00

Speed rpm : 1410...1440
4th rack travel in: 1500
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 62...70
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.0

Testing:

Speed rpm : 100
Minimum rack travel: 7.60
Speed rpm : 350
Rack travel in mm : 5.90...6.10

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 11.70...11.80

Measurement

Speed 1/min : 500

1st pressure hPa : 350
Rack travel in m: 12.60...12.80
2nd pressure hPa : 500
Rack travel in m: 13.70...13.90
3rd pressure hPa : 1000
Rack travel in m: 14.70...14.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 900
Del.quantity cm³/ : 101.0...104.0
1000 s: (98.5...106.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 42.0...44.0
1000 s: (40.0...46.0)
Spread cm³ : 3.50
1000 s: (6.00)

BREAKAWAY

N08

1st version
1mm rack travel less than

full load rack tr: 13.70
Speed rpm : 1330...1340

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 100.0...110.0
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.90...6.10
Del.quantity cm³/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm³ : 3.50
1000 s: (5.00)

Remarks:

Test hydr. locking device for starting
with 500...1000 hPa air pressure.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 72
 Edition : 21.08.92
 Replaces : 08.90
 Test oil : ISO-4113
 Combination no. : 0 403 476 072
 Injection pump
 Pump designation : PES6MW100/72ORS1172-
 1
 EP type number : 0 413 406 166
 Governor
 Governor design. : RSV350...1300MWOA329
 -5
 Governor no. : 0 420 085 119

Customer-spec. information
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 184.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)
 Rack travel in mm : 19.00...21.00
 firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1280

Rack travel in mm : 15.40...15.50

Del.quantity cm³/ : 12.2...12.4

100 s: (12.0...12.6)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del.quantity cm³/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1280

Aneroid pressure h: 1500

Del.quantity : 122.0...124.0

1000 : (120.0...126.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 98...106

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 14.40
Speed rpm : 1330...1340
2nd rack travel in: 4.00
Speed rpm : 1420...1450
4th rack travel in: 1580
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 67...75
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.0

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 350
Rack travel in mm : 5.90...6.10

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 11.00...11.10

Measurement

Speed 1/min : 500

1st pressure hPa : 450
Rack travel in m: 12.90...13.10
2nd pressure hPa : 650
Rack travel in m: 13.90...14.10
3rd pressure hPa : 1500
Rack travel in m: 15.40...15.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500
Speed rpm : 800
Del.quantity cm3/ : 113.5...116.5
1000 s: (111.0...119.0)
Spread cm3 : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm3/ : 33.0...35.0
1000 s: (31.0...37.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 14.40
Speed rpm : 1330...1340

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 105.0...115.0
1000 s: (102.0...118.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.90...6.10
Del.quantity cm3/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm3 : 3.50
1000 s: (5.00)

Remarks:

Test hydr. locking device for starting
with 500...1000 hPa air pressure.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 75
 Edition : 21.08.92
 Replaces : 11.90
 Test oil : ISO-4113

Combination no. : 0 403 476 075

Injection pump
 Pump designation : PES6MW100/72ORS1130
 EP type number : 0 413 406 122
 Governor
 Governor design. : RSV350...750MWA336-4
 Governor no. : 0 420 085 160

Customer-spec. information
 Customer : MB-NFZ

Engine : OM366A

1st version kW : 84.0
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 700

 Rack travel in mm : 12.00. .12.10

 Del.quantity cm³/ : 8.0...8.2
 100 s: (7.8...8.4)

 Spread cm³ : 0.3
 100 s: (0.6)

2nd speed rpm : 350.0
 Rack travel in mm : 5.8...6.8
 Del.quantity cm³/ : 0.9...1.3
 100 s: (0.6...1.5)
 Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension
 Click setting x : 2.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700
 Del.quantity : 80.0...82.0
 1000 : (78.0...84.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 74...82

Setting point:
 Speed rpm : 800
 Rack travel in mm : 0.6

Testing:
 1st rack travel in: 11.0

Speed rpm : 750...755 *
2nd rack travel in: 4.00
Speed rpm : 775...788
4th rack travel in: 850
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 61...69
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.3

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 350
Rack travel in mm : 5.80...6.80

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.0
Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 88.0...98.0
1000 s: (85.0...101.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.80...6.80
Del.quantity cm³/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

* Read off speed set under 1.
Add 25...35 min⁻¹ to this speed. The
control-rod travel under 2. must be
attained with the calculated speed
profile.

Observe VDT-I-420/120

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 D 74
 Edition : 21.08.92
 Replaces : 11.90
 Test oil : ISO-4113
 Combination no. : 0 403 476 078
 Injection pump
 Pump designation : PES6MW100/72ORS1129
 EP type number : 0 413 406 121
 Governor
 Governor design. : RSV350...750MWOA336-
 3
 Governor no. : 0 420 085 159

Customer-spec. information
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kw : 94.0
 Rated speed : 1500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 419 992 198
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 0 681 343 009
 Opening
 pressure, bar : 172...175
 Test lines : 1 680 750 089
 Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32
 Prestroke mm : 3.70...3.80
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 700
 Rack travel in mm : 12.50...12.60
 Del. quantity cm³/ : 8.5...8.7
 100 s : (8.3...8.9)
 Spread cm³ : 0.3
 100 s : (0.6)

2nd speed rpm : 350.0
 Rack travel in mm : 5.8...6.8
 Del. quantity cm³/ : 0.9...1.3
 100 s : (0.6...1.5)
 Spread cm³ : 0.3
 100 s : (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension
 Click setting x : 2.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 700
 Del. quantity : 85.0...87.0
 1000 : (83.0...89.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 74...82

Setting point:
 Speed rpm : 800
 Rack travel in mm : 0.6

Testing:
 1st rack travel in: 11.5

Speed rpm : 750...755 *
2nd rack travel in: 4.00
Speed rpm : 775...788
4th rack travel in: 850
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 60...68
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.3

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 350
Rack travel in mm : 5.80...6.80

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

BREAKAWAY

1st version
1mm rack travel less than

full load rack tr: 11.5
Speed rpm : 750..755

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 88.0...98.0
1000 s: (85.0...101.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.80...6.80
Del. quantity cm³/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm³ : 3.50
1000 s: (5.50)

Remarks:

:

* Read off speed set under 1.
Add 25...35 min⁻¹ to this speed. The
control-rod travel under 2. must be
attained with the calculated speed
profile.

Observe VDT-I-420/120

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 H
 Edition : 21.08.92
 Replaces : 03.90
 Test oil : ISO-4113

Combination no. : 0 403 476 079

Injection pump
 Pump designation : PES6MW100/720RS1191
 EP type number : 0 413 406 179
 Governor
 Governor design. : RSV750...1250MWA325
 -3
 Governor no. : 0 420 085 129

Customer-spec. information
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 162.0
 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1230

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 11.4...11.6
 100 s: (11.2...11.8)

Spread cm3 : 0.3
 100 s: (0.6)

2nd speed rpm : 750.0
 Rack travel in mm : 5.2...6.0
 Del.quantity cm3/ : 1.5...1.9
 100 s: (1.2...2.1)

Spread cm3 : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension
 Click setting x : 2.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1230
 Del.quantity : 114.0...116.0
 1000 : (112.0...118.0)

Spread cm3 : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 88...96

Setting point:
 Speed rpm : 800
 Rack travel in mm : 0.6

Testing:
 1st rack travel in: 12.9

Speed rpm : 1270...1275 *
2nd rack travel in: 4.00
Speed rpm : 1295...1310
4th rack travel in: 1350
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 72...80
Setting point w/out bumper spring
Speed rpm : 750
Rack travel in mm : 5.6

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 750
Rack travel in mm : 5.20...6.00

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750
Del.quantity cm³/ : 106.0...109.0
1000 s: (103.5...111.5)
Spread cm³ : 5.00
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.9
Speed rpm : 1270...1275

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 95.0...105.0
1000 s: (92.0...108.0)

LOW IDLE

Speed rpm : 750
Rack travel in mm : 5.20...6.00
Del.quantity cm³/ : 15.0...19.0
1000 s: (12.5...21.5)
Spread cm³ : 3.50
1000 s: (5.00)

Remarks:

:

* Read off speed set under 1.
Add 25...35 min⁻¹ to this speed. The
control-rod travel under 2. must be
attained with the calculated speed
profile.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 H 1
 Edition : 21.08.92
 Replaces : 05.91
 Test oil : ISO-4113

Combination no. : 0 403 476 080

Injection pump
 Pump designation : PES6MW100/720RS1191
 EP type number : 0 413 406 179
 Governor
 Governor design. : RSV350...1300MWOA329
 -6

Governer no. : 0 420 085 136

Customer-spec. information
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kw : 170.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1280

Rack travel in mm : 14.00...14.10

Del.quantity cm³/ : 11.2...11.4

100 s: (11.0...11.6)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.0...6.2

Del.quantity cm³/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm³ : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1280

Aneroid pressure h: 1000

Del.quantity : 112.0...114.0

1000 : (110.0...116.0)

Spread cm³ : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 105...113

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.0

Speed rpm : 1330...1335 *

2nd rack travel in: 4.00

Speed rpm : 1410...1423
4th rack travel in: 1550
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 75...83
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.1

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 350
Rack travel in mm : 6.00...6.20

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 10.10...10.20

Measurement

Speed 1/min : 500

1st pressure hPa : 350
Rack travel in m: 11.30...11.40
2nd pressure hPa : 500
Rack travel in m: 12.40...12.70
3rd pressure hPa : 1000
Rack travel in m: 14.00...14.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 600
Del. quantity cm³/ : 101.0...104.0
1000 s: (98.5...106.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del. quantity cm³/ : 35.0...37.0
1000 s: (33.0...39.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.0
Speed rpm : 1330...1335

STARTING FUEL DELIVERY

Speed rpm : 100
Del. quantity cm³/ : 100.0...110.0
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.00...6.20
Del. quantity cm³/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm³ : 3.50
1000 s: (5.00)

Remarks:

* Read off speed set under 1.
Add 80...88 min⁻¹ to this speed. The
control-rod travel under 2. must be
attained with the calculated speed
profile.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE 8,4 D
Edition : 03.12.92
Replaces : 07.92
Test oil : ISO-4113

Combination no. : 0 403 476 081

Injection pump
Pump designation : PES6MW100/72ORS1196-1
EP type number : 0 413 406 219
Governor
Governor design. : RSV350...1050MWOA338
Governor no. : 0 420 085 138

Customer-spec. information
Customer : LIEBHERR

Engine : D 916 T

1st version kW : 170.0
Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
inlet temp. °C : 38...42

Overflow valve : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder
assembly : 0 681 343 009

Opening
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter
x Wall thickness
x Length mm : 6.00x2.00x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values _____

BEGINNING OF DELIVERY
Test pressure, bar: 30...32

Prestroke mm : 3.40...3.50
: (3.35...3.55)

Rack travel in mm : 9.00...12.00
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.20...11.30

Del. quantity cm³/ : 13.6...13.8

100 s: (13.4...14.0)

Spread cm³ : 0.3

100 s: (0.6)

2nd speed rpm : 350.0
Rack travel in mm : 8.3...8.7
Del. quantity cm³/ : 7.1...7.5
100 s: (6.8...7.7)
Spread cm³ : 0.3
100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
Degree: -3
Speed rpm : 800
Rack travel in mm : 0.30...1.00

Governor spring pre-tension
Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
Speed rpm : 1050
Aneroid pressure h: 1300
Del. quantity : 136.0...138.0
1000 : (134.0...140.0)
Spread cm³ : 3.50
1000 : (6.00)

RATED SPEED

1st version
Control lever
position degrees: 98...106

Setting point:
Speed rpm : 800
Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.20
Speed rpm : 1070...1080
2nd rack travel in: 4.00
Speed rpm : 1125...1145
3rd rack travel in: 4.00
Speed rpm : 1160...1180
4th rack travel in: 1250
Speed rpm : 0.30...1.70

LOW IDLE 1
Control lever
position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.7

Testing:
Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 350
Rack travel in mm : 5.50...5.90

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 11.20...11.30
2nd speed rpm : 500
Rack travel in m: 11.20...11.30
3rd speed rpm : 800
Rack travel in m: 11.20...11.30
5th speed rpm : 400
Rack travel in m: 12.60...12.70

Aneroid/Altitude
Compensator Test

1st version
Setting
Speed rpm : 550
Pressure hPa : -
Rack travel in mm : 10.40...10.60

Measurement
Speed 1/min : 550

1st pressure hPa : 390
Rack travel in m: 10.60...10.70
2nd pressure hPa : 520
Rack travel in m: 11.00...11.20
3rd pressure hPa : 1300
Rack travel in m: 11.20...11.30

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: 1300
Speed rpm : 500

Del.quantity cm³/ : 136.0...139.0
1000 s: (133.5...141.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: 1300
Speed rpm : 800
Del.quantity cm³/ : 135.0...138.0
1000 s: (132.5...140.5)
Aneroid pressure h: -
Speed rpm : 550
Del.quantity cm³/ : 120.0...122.0
1000 s: (118.0...124.0)

BREAKAWAY

1st version
1mm rack travel less than
full load rack tr: 10.20
Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 127.0...137.0
1000 s: (124.0...140.0)
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 8.30...8.70
Del.quantity cm³/ : 71.0...75.0
1000 s: (68.5...77.5)
Spread cm³ : 3.50
1000 s: (5.00)

Remarks:

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : LIE
 Edition : 03.12.92
 Replaces : -
 Test oil : ISO-4113
 Combination no. : 0 403 476 081A
 Injection pump
 Pump designation : PES6MW100/720RS1196-1
 EP type number : 0 413 406 219
 Governor
 Governor design. : RSV350...1050MWOA338
 Governor no. : 0 420 085 138

Customer-spec. information
 Customer : LIEBHERR

Engine : D 916 T

1st version kW : 170.0
 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 417 413 049
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 0 681 343 009
 Opening
 pressure, bar : 172...175
 Test lines : 1 680 750 008
 Outside diameter
 x Wall thickness
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32
 Prestroke mm : 3.40...3.50
 : (3.35...3.55)

N21

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1050
 Rack travel in mm : 11.20...11.30
 Del. quantity cm³/ : 13.6...13.8
 100 s: (13.4...14.0)
 Spread cm³ : 0.3
 100 s: (0.6)
 2nd speed rpm : 350.0
 Rack travel in mm : 8.3...8.7
 Del. quantity cm³/ : 7.1...7.5
 100 s: (6.8...7.7)
 Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension
 Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1050
 Aneroid pressure h: 1300
 Del. quantity : 136.0...138.0
 1000 : (134.0...140.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 98...106

Setting point:
 Speed rpm : 800
 Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.20
Speed rpm : 1070...1080
2nd rack travel in: 4.00
Speed rpm : 1125...1145
3rd rack travel in: 4.00
Speed rpm : 1160...1180
4th rack travel in: 1250
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 70...78
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.7

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 350
Rack travel in mm : 5.50...5.90

TORQUE CONTROL

Torque control curve - 1st version
1st speed rpm : 1050
Rack travel in m: 11.20...11.30
2nd speed rpm : 500
Rack travel in m: 11.20...11.30
3rd speed rpm : 800
Rack travel in m: 11.20...11.30
5th speed rpm : 400
Rack travel in m: 12.60...12.70

Aneroid/Altitude Compensator Test

1st version

Setting
Speed rpm : 550
Pressure hPa : -
Rack travel mm : 10.40...10.60

Measurement

Speed 1/min : 550

1st pressure hPa : 390
Rack travel in m: 10.60...10.70
2nd pressure hPa : 520
Rack travel in m: 11.00...11.20
3rd pressure hPa : 1300
Rack travel in m: 11.20...11.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1300
Speed rpm : 500

Del.quantity cm³/ : 136.0...139.0
1000 s: (133.5...141.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: 1300
Speed rpm : 800
Del.quantity cm³/ : 135.0...138.0
1000 s: (132.5...140.5)
Aneroid pressure h: -
Speed rpm : 550
Del.quantity cm³/ : 120.0...122.0
1000 s: (118.0...124.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.20
Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 127.0...137.0
1000 s: (124.0...140.0)
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 350
Rack travel in mm : 8.30...8.70
Del.quantity cm³/ : 71.0...75.0
1000 s: (68.5...77.5)
Spread cm³ : 3.50
1000 s: (5.00)

Remarks:

Check electrically unlatched starting
fuel delivery (EES) with 24 volt.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 L
 Edition : 21.08.92
 Replaces : 08.90
 Test oil : ISO-4113

Combination no. : 0 403 476 085

Injection pump
 Pump designation : PES6MW100/720RS1205
 EP type number : 0 413 406 195
 Governor
 Governor design. : RSV350...1300MWOA329
 -7
 Governor no. : 0 420 085 142

Customer-spec. information
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 184.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.20...3.30
 : (3.15...3.35)

N23

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1280

Rack travel in mm : 15.50...15.60

Del.quantity cm³/ : 12.8...13.0
 100 s: (12.6...13.2)

Spread cm³ : 0.3
 100 s: (0.6)

2nd speed rpm : 350.0
 Rack travel in mm : 6.3...6.5
 Del.quantity cm³/ : 1.0...1.4
 100 s: (0.7...1.6)

Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension
 Click setting x : 3.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1280
 Aneroid pressure h: 1200
 Del.quantity : 128.0...130.0
 1000 : (126.0...132.0)

Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 96...104

Setting point:
 Speed rpm : 800
 Rack travel in mm : 0.6

Testing:

1st rack travel in: 14.50
Speed rpm : 1330...1340
2nd rack travel in: 4.00
Speed rpm : 1420...1450
4th rack travel in: 1580
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 65...73
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 6.4

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 350
Rack travel in mm : 6.30...6.50

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 11.30...11.40

Measurement

Speed 1/min : 500

1st pressure hPa : 450
Rack travel in m: 12.70...12.90
2nd pressure hPa : 650
Rack travel in m: 13.90...14.10
3rd pressure hPa : 1200
Rack travel in m: 15.50...15.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200
Speed rpm : 800
Del.quantity cm³/ : 122.0...125.0
1000 s: (119.5...127.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 48.0...50.0
1000 s: (46.0...52.0)

BREAKAWAY

N24

1st version
1mm rack travel less than

full load rack tr: 14.50
Speed rpm : 1330...1340

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 110.0...120.0
1000 s: (107.0...123.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.30...6.50
Del.quantity cm³/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm³ : 3.50
1000 s: (5.00)

Remarks:

Test hydr. locking device for starting
with 500...1000 hPa air pressure.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 H 2
 Edition : 21.08.92
 Replaces : 08.90
 Test oil : ISO-4113
 Combination no. : 0 403 476 086
 Injection pump
 Pump designation : PES6MW100/720RS1191
 EP type number : 0 413 406 179
 Governor
 Governor design. : RSV425...1000MWOA329
 -8
 Governor no. : 0 420 085 143

Customer-spec. information
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 151.0
 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 419 992 198
 Inlet press., bar : 1.50
 Test nozzle holder
 assembly : 0 681 343 009
 Opening
 pressure, bar : 172...175
 Test lines : 1 680 750 089
 Outside diameter
 x Wall thickness
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32
 Prestroke mm : 3.50...3.60
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 980
 Rack travel in mm : 14.90...15.00
 Del.quantity cm³/ : 11.0...11.2
 100 s: (10.8...11.4)
 Spread cm³ : 0.3
 100 s: (0.6)
 2nd speed rpm : 425.0
 Rack travel in mm : 6.3...6.5
 Del.quantity cm³/ : 0.9...1.3
 100 s: (0.6...1.5)
 Spread cm³ : 0.3
 100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension
 Click setting x : 3.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 980
 Aneroid pressure h: 1000
 Del.quantity : 110.0...112.0
 1000 : (108.0...114.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 86...94

Setting point:
 Speed rpm : 800
 Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.90
Speed rpm : 1030...1040
2nd rack travel in: 4.00
Speed rpm : 1100...1130
4th rack travel in: 1250
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 68...76
Setting point w/out bumper spring
Speed rpm : 425
Rack travel in mm : 6.4

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 425
Rack travel in mm : 6.30...6.50

SET IDLE AUXILIARY SPRING
Rack travel in mm : 2.00

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 11.70...11.80

Measurement

Speed 1/min : 500

1st pressure hPa : 200
Rack travel in m: 12.60...12.80
2nd pressure hPa : 350
Rack travel in m: 13.90...14.10
3rd pressure hPa : 1000
Rack travel in m: 14.90...15.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 600
Del.quantity cm³/ : 103.0...106.0
1000 s: (100.5...108.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 50.0...52.0
1000 s: (48.0...54.0)

BREAKAWAY

N26

1st version
1mm rack travel less than

full load rack tr: 13.90
Speed rpm : 1030...1040

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 100.0...110.0
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 425
Rack travel in mm : 6.30...6.50
Del.quantity cm³/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm³ : 3.50
1000 s: (5.00)

Remarks:

:

Test hydr. locking device for starting
with 500...1000 hPa air pressure.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 6,0 H 3
 Edition : 21.08.92
 Replaces : 05.91
 Test oil : ISO-4113
 Combination no. : 0 403 476 093
 Injection pump
 Pump designation : PES6MW100/720RS1191
 EP type number : 0 413 406 179
 Governor
 Governor design. : RSV350...1300MWOA329
 -9
 Governor no. : 0 420 085 151

Customer-spec. information
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 155.0
 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil
 inlet temp. °C : 38...42
 Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder
 assembly : 0 681 343 009

Opening
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
 x Wall thickness
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values
 Insp. values in parentheses
 Set equal delivery quant.
 per values _____

BEGINNING OF DELIVERY
 Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300
 Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1280
 Rack travel in mm : 12.00...12.10
 Del. quantity cm³/ : 9.8...10.0
 100 s : (9.6...10.2)
 Spread cm³ : 0.3
 100 s : (0.6)

2nd speed rpm : 350.0
 Rack travel in mm : 5.3...5.5
 Del. quantity cm³/ : 0.9...1.3
 100 s : (0.6...1.5)
 Spread cm³ : 0.3
 100 s : (0.5)

GUIDE SLEEVE POSITION

Control-lever position
 Degree: -3
 Speed rpm : 800
 Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version
 Speed rpm : 1280
 Aneroid pressure h: 1000
 Del. quantity : 98.0...100.0
 1000 : (96.0...102.0)
 Spread cm³ : 3.50
 1000 : (6.00)

RATED SPEED

1st version
 Control lever
 position degrees: 105...113

Setting point:
 Speed rpm : 800
 Rack travel in mm : 0.6

Testing:
 1st rack travel in: 11.0
 Speed rpm : 1330...1335 *
 2nd rack travel in: 4.00

Speed rpm : 1410...1423
4th rack travel in: 1550
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever
position degrees: 75...83
Setting point w/out bumper spring
Speed rpm : 350
Rack travel in mm : 5.4

Testing:

Speed rpm : 100
Minimum rack travel: 19.00
Speed rpm : 350
Rack travel in mm : 5.30...5.50

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude
Compensator Test

1st version

Setting
Speed rpm : 500
Pressure hPa : -
Rack travel mm : 9.00...9.10

Measurement

Speed 1/min : 500
1st pressure hPa : 300
Rack travel in m: 10.60...10.70
2nd pressure hPa : 380
Rack travel in m: 11.20...11.50
3rd pressure hPa : 1000
Rack travel in m: 12.00...12.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000
Speed rpm : 600
Del.quantity cm³/ : 85.0...88.0
1000 s: (82.5...90.5)
Spread cm³ : 5.00
1000 s: (7.0)
Aneroid pressure h: -
Speed rpm : 500
Del.quantity cm³/ : 35.0...37.0
1000 s: (33.0...39.0)

BREAKAWAY

1st version

N28

1mm rack travel less than

full load rack tr: 11.0
Speed rpm : 1330...1335

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm³/ : 100.0...110.0
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 5.30...5.50
Del.quantity cm³/ : 9.0...13.0
1000 s: (6.5...15.5)
Spread cm³ : 3.50
1000 s: (5.00)

Remarks:

:

Test hydr. locking device for starting
with 500...1000 hPa air pressure.

* Read off speed set under 1.
Add 80...88 min⁻¹ to this speed. The
control-rod travel under 2. must be
attained with the calculated speed
profile.